

The Subsistence Harvest of Harbor Seal and Sea Lion by Alaska Natives in 1993

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Frontispiece. **Brown bear crest hat, Sitka (Tlingit), ornamented with whiskers from the Steller sea lion. The brown bear and sea lion are crests of several Tlingit clans in southeast Alaska. The wood hat is painted in red, light blue, and black, with abalone eyes and opercula teeth. The hat was worn by Tlingit nobility at potlatches. Basketry cylinders at the top were added at times the crest hat was ceremonially presented and validated. Collected 1867-68, 69-30-10/1599. Photo courtesy Peabody Museum of Archaeology and Ethnology, Harvard University.**

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ABSTRACT

This report describes the subsistence takes of harbor seal (*Phoca vitulina*) and Steller sea lion (*Eumetopias jubatus*) by Alaska Natives in 1993, including size, seasons, geographic distribution, and age and sex of the harvest. Information is summarized at the state, region, and community levels. The research was conducted by the Division of Subsistence, Alaska Department of Fish and Game under contract with the National Oceanic and Atmospheric Administration and the National Marine Fisheries Service. Information derives from systematic interviews with hunters and users of marine mammals in 2,087 households in 60 coastal communities within the geographic ranges of the two species. Local researchers conducted most of the household interviews as part of a local and regional researcher network. The project received generous support from leaders of a number of Native governments and regional and statewide associations.

During 1993, the estimated subsistence take of harbor seal by Alaska Natives was 2,729 seals, with a 95 percent confidence range of between 2,513 to 3,464 seals. Of the take, 13.5 percent (369 seals) were struck and lost and 86.5 percent (2,360 seals) were harvested. In addition, there were 265 seals taken in North Bristol Bay which were classified as spotted seal (*Phoca largha*) based on ecological evidence. Harbor seals were taken in 56 of 60 surveyed communities. An estimated 853 households hunted harbor seal, 665 (78 percent) successfully. The largest takes (59 percent of the take) were by Tlingit and Haida hunters in the Southeast region. Harbor seals were taken in all months of 1993, with two seasonal peaks during March-April and August-December. Hunters reported taking male harbor seals over females by a ratio of about 2.3 to 1, and reported taking primarily adult harbor seals.

During 1993, the estimated subsistence take of sea lions by Alaska Natives was 487 sea lions, with a 95 percent confidence range of between 391 to 630 sea lions. Of the take, 28.6 percent (139 sea lions) were struck and lost and 71.4 percent (348 sea lions) were harvested. Sea lions were taken in 21 of 60 surveyed communities. An estimated 223 households hunted sea lion, 171 (77 percent) successfully. The largest takes were by Aleut hunters in the Aleutian and Pribilof islands. Sea lions were taken in all -months of 1993, with seasonal peaks during September-November. Hunters reported taking males over females about 4.5 to 1, and reported taking juvenile sea lions over adults or pups about 1.5 to 1.

The estimated subsistence takes of harbor seal in 1992 (2,867 seals) and 1993 (2,729 seals) differed by 5 percent (138 seals). The estimated subsistence takes of sea lion in 1992 (548 sea lions) and 1993 (487 sea lions) differed by 11 percent (61 sea lions). Neither difference was statistically significant. The age and sex distributions of the statewide harvests of harbor seal and sea lion were similar between 1992 and 1993. Comparison of subsistence takes at the community level suggests variability across years due to local ecological, economic, and cultural factors.

By a number of standards, the network of local and regional researchers for collecting subsistence information was assessed as working successfully in 1993. Subsistence information meeting project standards was received from 59 of 60 communities. Household sample sizes and response rates were high. Overall similarities between the 1992 and 1993 data sets on several parameters suggest that no data anomalies were introduced by using a network of local and regional researchers. Overall, the project's findings indicate that subsistence takes of marine mammals can be successfully documented with a research methodology that utilizes local researchers in major research roles.

ACKNOWLEDGEMENTS

This project would not have been possible without tremendous local support in every community where we conducted the survey. We wish to thank each tribal council, city council, and all of the regional Native organizations who facilitated our work. Carl M. Hild and Carl Jack of RurAL CAP assisted us in this effort and merit special mention, along with members of the Indigenous People's Council for Marine Mammals who reviewed the survey instruments and preliminary survey findings. Heartfelt thanks are owed to the many elders and local marine mammal experts who allowed us to interview them at length about their lifelong use and observations of sea lions and ha&or seals. In addition, we are deeply indebted to the many hundreds of hunters who volunteered to report their subsistence harvests to our staff and to locally hired research assistants.

The seventy-four local researchers who conducted household interviews deserve to be recognized individually for their high level of interest and work. We look forward to working with many again in the near future as the project moves into its third year.

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Agrafina Kerr, Nikolski
George Inga Sr., Old Harbor
Robert Katelnikoff, Ouzinkie
James Phillips, Pelican
Harry Kosbruk, Penysville
Carol Shangin, Penysville
Nancy Benson, Petersburg
Mike Lopez, Petersburg
Nikki Shanigan, Pilot Point
Mary Malchoff, Port Graham
Anna Marie Metcalf, Port Graham
Robert Christensen, Port Heiden
Robert Nelson Sr., Port Lions
Pete Squartsoff, Port Lions
Grace Mercuriel, Saint George
Christine Mack, Sand Point
Chris Makua, Saxman
Norman Natkong, Saxman
Lillian Elvsas, Seldovia
Vincent Komok, Seward
Vicki Bartles, Sitka
Roberta Littlefield, Sitka
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INTRODUCTION

This report describes the subsistence takes of harbor seal (*Phoca vitulina*) and Steller sea lion (*Eumetopias jubatus*) by Alaska Natives in 1993. It is the second report of a two-year study of the subsistence uses of harbor seal and sea lion in Alaska. Findings for the first study year were reported in Wolfe and Mishler (1993). The research was conducted by the Division of Subsistence of the Alaska Department of Fish and Game under contract with the National Oceanic and Atmospheric Administration and the National Marine Fisheries Service. The study was conducted in cooperation with the Indigenous People's Council for Marine Mammals and the Rural Alaska Community Action Program.

The report provides information on the subsistence takes of harbor seal and sea lion during 1993, including size, seasons, geographic distributions, and age and sex of harvested animals. Information on subsistence uses derives from systematic interviews with marine mammal hunters in 60 communities (Fig. 1, Table 2). Information was collected principally by local researchers trained in each community, working within a network of local and regional researchers.

The geographic area covered by this report was defined as the Alaska coastal waters south of Cape Newenham, including the Pribilof Islands, which corresponds with the general distributions of harbor seal and sea lion in Alaska (Figs. 2 and 3, from Burns, Frost, and Lowry 1985). The use of harbor seal and sea lion by Alaska Natives for food and raw materials has a long tradition in this part of Alaska, since before historic contact through to the present. The Alaska Native groups using harbor seal include the Aleut of the Aleutian Islands, the Alutiiq and Eyak of the Pacific Gulf coast, the Dena'ina of Cook Inlet, the Tlingit, Haida, and Tsimshian of the southeast archipelago, and the Yup'ik of southwest Alaska.

The Aleut of the Aleutian and Pribilof islands and the Alutiiq of certain communities of the Kodiak Island and the North Pacific Rim regions currently are the primary users of sea lion. Sea lion are used more occasionally by Tlingit, Haida, Tsimshian, and Yup'ik groups. Subsistence products derived from harbor seal and sea lion by Alaska Natives include oil, meat, and skins, as described in Wolfe and Mishler (1993).

The report is organized in several sections. The Methodology section describes the methods used to collect information. Two sections (The Subsistence Take of Harbor Seal in 1993 and The Subsistence Take of Sea Lion in 1993) present information on the statewide takes of harbor seal and sea lion, summarized by community and region. In the Discussion section are interpretations of the 1993 survey year, including comparisons with other years for select communities and a discussion of the effectiveness of the network of local and regional researchers for documenting subsistence uses. Appendix A contains a copy of the survey instrument used in household interviews with marine mammal hunters. Appendix B contains regional summaries of the subsistence takes of harbor seal and sea lion. Appendix C contains detailed materials on the subsistence takes of harbor seal and sea lion by individual community.

METHODOLOGY

Information on the subsistence takes of harbor seal and sea lion in 1993 was collected through interviews with persons in 2,087 Alaska Native households in 60 coastal communities (Table 2). Respondents were asked to recall information about their household's last year's use of marine mammals. The survey instrument administered in household interviews was similar to one used by the Division of Subsistence for 1992, with a few changes to improve readability (see Appendix A).

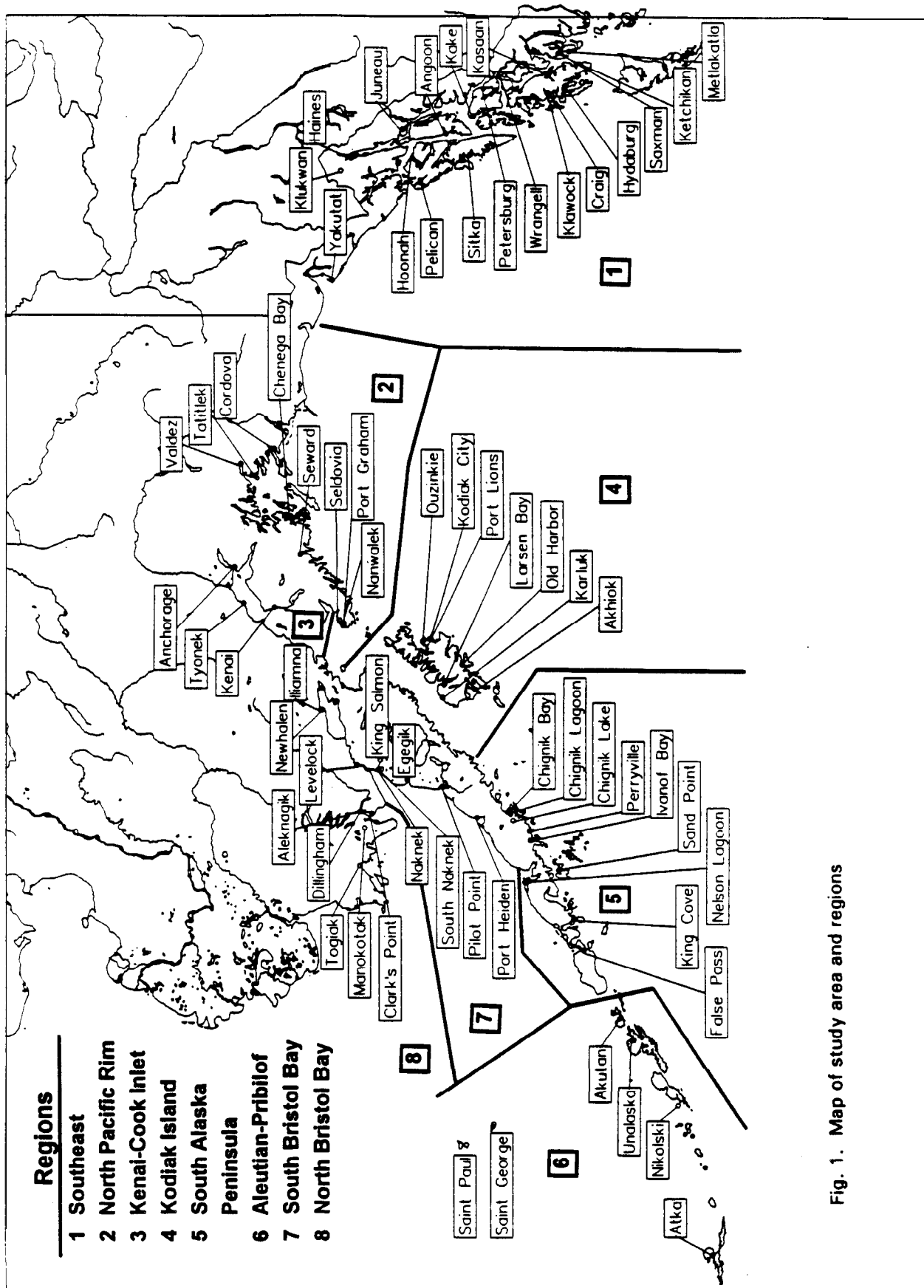


Fig. 1. Map of study area and regions

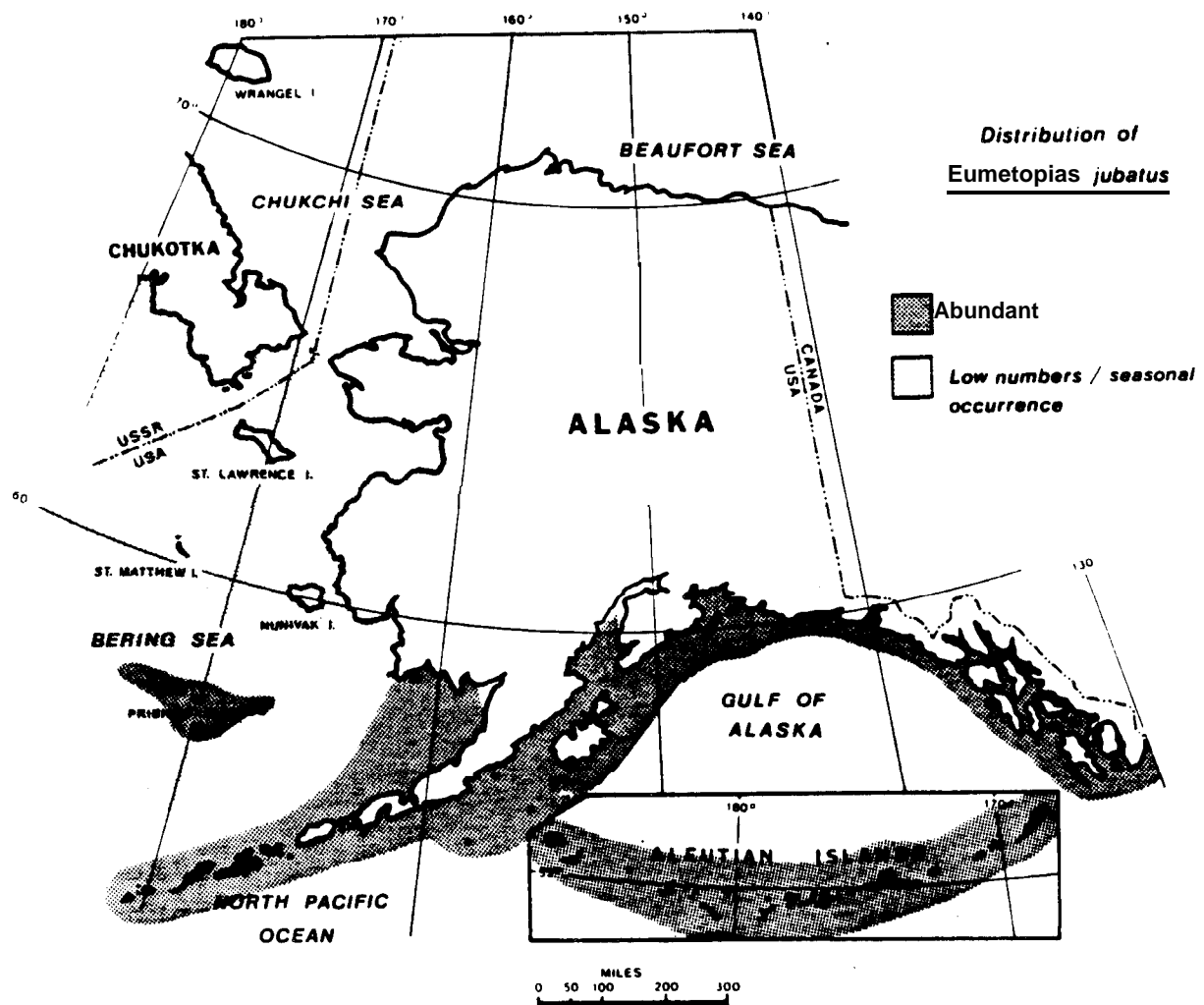


Fig. 2. General distribution of sea lion in Alaska. (Source: Burns, Frost, and Lowry 1985)

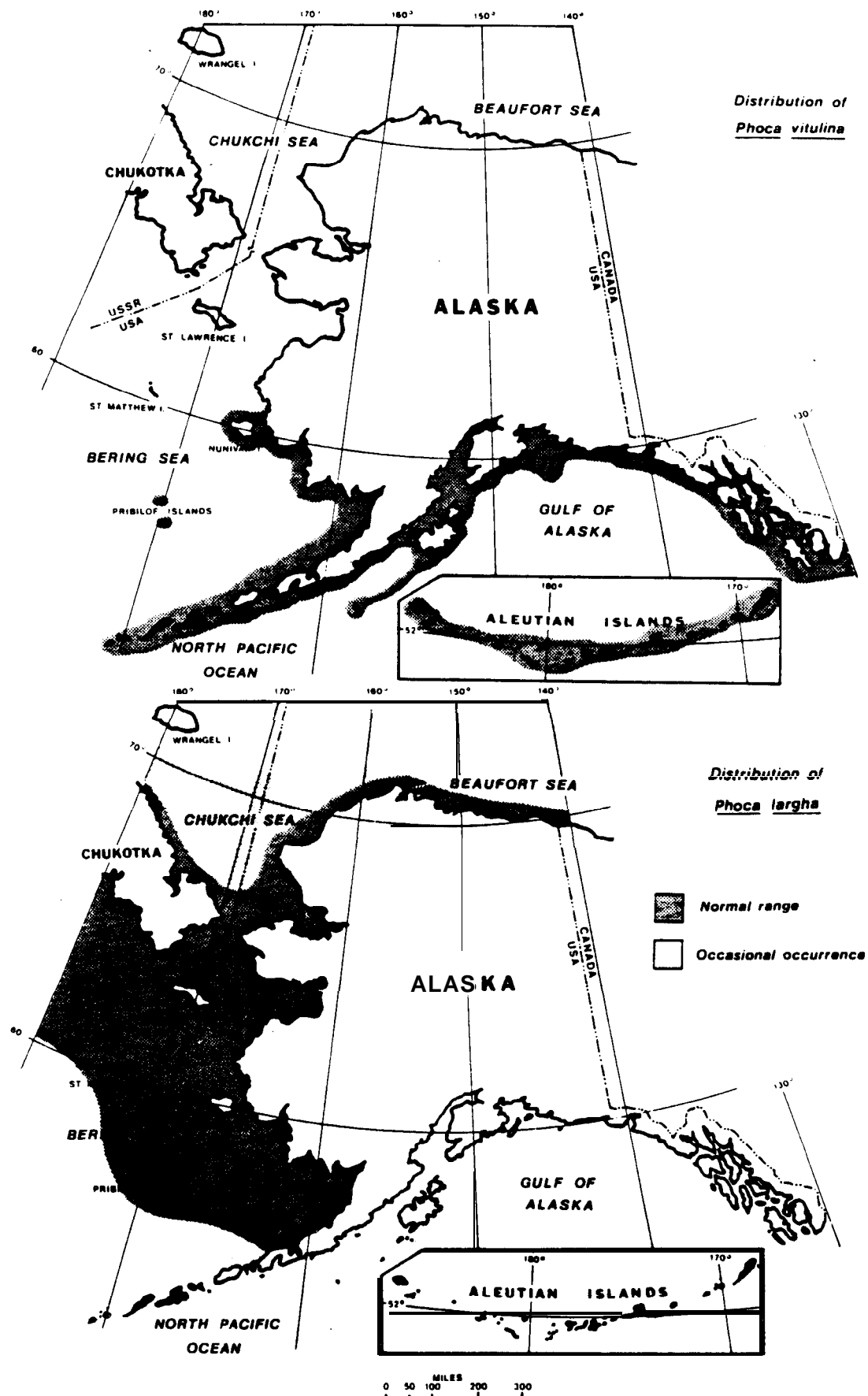


Fig. 3. [Top] General distribution of harbor seal (*Phoca vitulina*) in Alaska. [Bottom] General distribution of spotted seal (*Phoca largha*) in Alaska. (Source: Burns, Frost, and Lowry 1985)

It was first developed in consultation with the Rural Alaska Community Action Program (RurAL CAP) and the Indigenous People's Council for Marine Mammals (IPCOMM). Household hunters were asked to recall the number of sea lions and harbor seals taken by household members during each month over the past year. The survey contained questions that pertained to harvest numbers, struck and lost animals, age of animals, and sex of animals. The survey also asked whether the household used, harvested, received, or gave away sea lion or harbor seal during the last year.

Interviews were conducted by local researchers hired and trained as part of the project, augmented by regional Division of Subsistence researchers in certain communities. Surveys were conducted in two rounds. The first survey was administered in December 1993 to cover the period from January through November 1993. The first survey round was scheduled to occur shortly after the November regional training sessions, but before the distractions of the Christmas holiday. The second survey was administered in May 1994 to cover the period from December 1993 through April 1994. The second survey round was scheduled to take place before the onset of salmon fishing, when many hunters are away from home. The following section describes aspects of the study design.

Contacts with Native Governments, Other Associations, and Marine Mammal Hunters

During the first year of the two-year study, a number of Native governments, Native leaders, and associations with interests in harbor seal and sea lion management were contacted to obtain support for the project. At onset, several statewide or regional organizations were contacted during project development -- the Alaska Federation of Natives; the Aleutians East Borough; Aleutian-Pribilof Islands Association; Bristol Bay Native Association; Central Council of Tlingit. and

Haida Indian Tribes of Alaska; Cook Inlet Region, Inc.; IPCOMM (meeting through RurAL CAP); Kodiak Area Native Association; and the North Pacific Rim (Chugachmiut). A variety of helpful suggestions were received from the statewide and regional organizations concerning procedures, contact persons in communities, and scheduling of the project. The survey instrument and key respondent question list were reviewed by members of RurAL CAP and IPCOMM.

In December 1993, results from the first survey round of the second study year were presented to IPCOMM. At that time, the Council passed a motion supporting the project, including a proposal for the collection of tissue samples for scientific analysis from subsistence takes by Native hunters. In June 1994, preliminary results from the first and second survey rounds (the second study year) were reviewed by IPCOMM.

A standard procedure of Division of Subsistence research in communities with Alaska Native governments is to solicit approval of subsistence projects by local Native governments, or by leaders of local government entities (see Fall 1990). A project will not be conducted in a community if the project is not supported by local Native governments or their leaders. During the first project year, contacts were made with representatives of all the entities listed in Table 1. The project received support in the communities listed in Table 2.

During the second project year, results from the 1992 study year were mailed to community leaders in all communities. Community leaders were consulted by phone about the continuation of the study in year two, and about the recruitment and hiring of local researchers. Feedback on the project the first year was generally good, so the project was continued in 60 communities. Many local governments were extremely helpful during the course of the project, especially by identifying Native households, potential local researchers, and marine mammal

**TABLE 1.
ORGANIZATIONS CONTACTED DURING THE PROJECT**

Community	Government/Organization Contacted
Akhiok	Akhiok Tribal Council City of Akhiok
Akutan	Akutan Traditional Village Council City of Akutan Akutan Corporation
Aleknagik	Aleknagik Tribal Council
Anchorage	Cook Inlet Tribal Council Alaska Federation of Natives
Angoon	City of Angoon
Atka	Atka IRA Council City of Atka
Chenega Bay	Chenega Bay IRA Council
Chignik Bay	Chignik Bay Traditional Village Council
Chignik Lagoon	Chignik Lagoon Traditional Village Council
Chignik Lake	Chignik Lake Traditional Village Council
Clark's Point	Clark's Point Traditional Council
Cordova	Traditional Village of Eyak
Craig	Shaan-Seet, Inc. City of Craig
Dillingham	Dillingham Traditional Council
Egegik	Egegik Traditional Council
False Pass	False Pass Tribal Council City of False Pass
Haines	Chilkat Indian Association
Hoonah	Hoonah Traditional Council
Hydaburg	Haida Corporation City of Hydaburg
Iliamna	Iliamna Village Council
Ivanof Bay	Ivanof Bay Traditional Village Council
Juneau	Tlingit and Haida Central Council Sealaska Auke Tribe Council Alaska Native Brotherhood/Sisterhood
Kake	Organized Village of Kake City of Kake
Karluk	Karluk IRA Council
Kenai	Kenai Indian Tribe IRA Cook Inlet Region, Inc.
Ketchikan	Ketchikan IRA Council Ketchikan Indian Corporation
King Cove	Agdaagux Tribe of King Cove Belofsky Village Council City of King Cove
King Salmon	King Salmon Traditional Council
Klawock	Klawock Cooperative Association Klawock Heenya Corporation
Klukwan	Chilkat Indian Village
Kodiak City	Kodiak Tribal Council Kodiak Area Native Association
Larsen Bay	Larsen Bay Tribal Council City of Larsen Bay
Levelock	Levelock Traditional Council

Community	Government/Organization Contacted
Manokotak	Manokotak Traditional Council
Metlakatla	Council Annette Islands Reserve Metlakatla Indian Community
Naknek	Naknek Traditional Council
Nanwalek	Nanwalek Traditional Council English Bay Corporation
Nelson Lagoon	Nelson Lagoon Village Council
Newhalen	Newhalen Traditional Council
Nikolski	Nikolski IRA Council Chaluka Corporation
Old Harbor	Old Harbor Tribal Council City of Old Harbor
Ouzinkie	Ouzinkie Native Corporation Ouzinkie Tribal Council City of Ouzinkie
Pelican	Tlingit and Haida Indians of Pelican Community Council City of Pelican
Perryville	Perryville Traditional Village Council
Petersburg	Petersburg Indian Association
Pilot Point	Pilot Point Traditional Council
Port Graham	Port Graham Village Council Port Graham Corporation
Port Heiden	Port Heiden Traditional Council
Port Lions	Port Lions Tribal Council City of Port Lions
Saint George	Saint George Traditional IRA Council Saint George Tanaq Corporation City of Saint George
Saint Paul	Tribal Government of Saint Paul City of Saint Paul
Sand Point	Unga Tribal Council Qagan Tayagugin Tribe of Sand Point City of Sand Point
Saxman	Saxman IRA Council City of Saxman
Seldovia	Seldovia Native Association
Seward	Qutekcak Native Tribe
Sitka	Alaska Native Brotherhood Sitka Tribal Council
South Naknek	South Naknek Traditional Council
Tatitlek	Tatitlek IRA Council
Toqiak	Tosiak Traditional Council
Tyonek	Native Village of Tyonek
Unalaska	Quawalangin Tribal Council
Valdez	Valdez Native Association
Wrangell	Wrangell Cooperative Association
Yakutat	Yakutat Alaska Native Brotherhood/Alaska Native Sisterhood Yakutat Native Association Yak-Tat Kwaan

experts in the community to contact. The support of local governments is gratefully acknowledged in the footnotes of the tables and figures in Appendix C.

Ultimately, the decision to participate in the project resided with each marine mammal hunter. Permission to administer the household harvest survey was asked of each individual respondent. This was done face-to-face at the person's home or during an initial phone contact. At this time, the purpose of the project was described. Marine mammal hunters and other respondents were informed that participation in interviews was completely voluntary. Respondents were told that their identities would be kept confidential in reports presenting the information. If a person declined to participate in the study, the person was thanked for his or her time and a survey was not conducted. Persons who were interviewed as part of the harvest survey were not paid. As indicated by the above procedures, the information in the report is based almost entirely on the knowledge and observations of indigenous peoples who use marine mammals, voluntarily given to local and regional researchers. Most marine mammal hunters generously offered their assistance to the study.

Local and Regional Researcher Network

A research network using local researchers and regional Division of Subsistence researchers was used to collect information on subsistence takes of sea lion and harbor seal during 1993. This type of research organization was developed by the Division of Subsistence during the first study year, and fully implemented the second study year. In each of the 60 communities selected for surveys, one or two local residents were selected, depending upon the size of the community, to perform the roles of a local researcher. The network of local researchers, under the supervision of and in collaboration with Division researchers in each region, conducted the household survey component of the project.

Local researchers received training from regional researchers at one-day sessions held in five central locations in November 1993 -- Juneau, Anchorage, Kodiak City, Dillingham, and Unalaska. At these training sessions, local researchers received instruction concerning the study's scientific and resource management contexts, project methodology, survey techniques, and findings from previous research periods. A process for updating each community's Native household lists was developed at the training session, and applied either at the training session or later in the community. A method for selecting household samples for each community also was developed and implemented. Problems and issues identified during surveys from the first study year were discussed and resolved during sessions. Local researchers were given the opportunity to practice the administration of surveys and the initial processing and handling of survey data.

One component of the regional training sessions was administrative. Participants filled out paperwork required by the state employment system to hire, track, pay, evaluate, and terminate local researchers. During the first study year, the Division used "translator services contracts" as the administrative vehicle for local hires. Because surveys administered in English were judged to fall outside the terms of the translator services contracts by the state Department of Administration, during the second year the Division of Subsistence used "non-permanent, seasonal Fish and Wildlife Technician IIs with waiver" as the administrative vehicle for hiring the network of local researchers. This system was found to fit state administrative employment standards, but involved more paperwork to get local researchers on state registers for hiring, and to create, evaluate, and terminate nonpermanent positions twice during a yearly cycle.

Research tasks were appropriately divided between regional researchers and local researchers. Regional researchers performed tasks such as obtaining formal support for the project from Native organizations, recruiting and selecting local

hires, developing household sampling regimes, training local researchers, supervising local researchers, proofing survey data with the assistance of local researchers in preparation for data entry and analysis, writing reports on each community's survey experience, and entering fieldnotes into a centralized database. Local researchers performed tasks such as updating community lists of households and hunters, implementing household sampling regimes, administering household surveys twice during the yearly cycle, data proofing of surveys and survey tracking forms, and mailing surveys and tracking sheets for data entry and analysis. An assessment of the functioning of this network of local and regional researchers is made in the Discussion section below.

Community Selection and Regional Groupings

Coastal Alaska communities with significant Alaska Native populations in the usual geographic ranges of harbor seal or sea lion were considered for inclusion in the study, listed in Table 2 by region. Four communities included during the first study year were dropped in the second year due to no or extremely low levels of use of harbor seal and sea lion -- Kasaan and Metlakatla (Southeast Region), Tyonek (Upper Cook Inlet), and Nelson Lagoon (South Alaska Peninsula). Newhalen and Iliamna (Iliamna Lake. Region) were not surveyed in the second year, because documenting takes of freshwater seal was not a goal of the project. Homer (Upper Cook Inlet) was added during the second year, to obtain a more complete coverage of the Kenai Peninsula area. Twin Hills was not surveyed in the first or second years because support for the project was not secured from local governments.

The 60 selected communities had a combined Alaska Native population of about 36,018 people according to the 1990 federal census. Excluding Anchorage (with about 14,569 Alaska Natives), the other 59 communities contained 21,449 Alaska Natives.

Non-Native households and communities without significant Alaska Native populations were not surveyed, assuming marine mammals are rarely harvested by non-Natives in Alaska. Native households were defined as households with one or more Native members. With a few exceptions (non-Natives married into Native households and non-Natives during the bounty period), the subsistence hunting of marine mammals by Euro-Americans has not been common in Alaska, as they are not traditional foods. Since 1972, marine mammal hunting by persons other than Alaska Natives has been prohibited by the federal Marine Mammal Protection Act. The exclusion of predominantly non-Native communities and non-Native households may lead to a slight underestimate of the total Alaska subsistence take of harbor seals and sea lions. Unsurveyed coastal communities in the study area included Adak, Beecher Pass, Coffman Cove, Cold Bay, Edna Bay, Elfin Cove, Gustavus, Hollis, Hyder, Kasaan, Metlakatla, Meyers Chuck, Nelson Lagoon, Point Baker, Port Alexander, Port Protection, Skagway, Tenakee Springs, Thorne Bay, Tyonek, Whale Pass, and Whittier. Certain culturally-heterogeneous communities were surveyed, such as Cordova, Juneau, Ketchikan, Kodiak City, Pelican, Petersburg, Seldovia, Seward, Sitka, Unalaska, Valdez and Wrangell.

Communities north of Cape Newenham were excluded from the study area because of the relatively low seasonal occurrence of harbor seal and sea lion. Sea lion and harbor seal are more occasionally taken within some communities north of Cape Newenham; however, the relative size and regularity of these harvests are thought to be substantially less than communities south of Cape Newenham. For instance, sea lion are seasonally present along the southwest portion of St. Lawrence Island and are taken certain years by residents of Gambell and Savoonga (Ellanna 1983:350; Little and Robbins 1984). However, we assessed that documenting sea lion and harbor seal takes in the many coastal communities north of Cape Newenham would entail substantial additional costs for a relatively small

number of kills. In addition, seal harvest information above Cape Newenham would be hard to interpret in any event, given the difficulties of knowing what portion of the seals taken are actually harbor seals and not spotted seals. Because northern coastal communities were excluded from the study area, the statewide estimates of sea lion and harbor seal takes should be considered minimum estimates.

For purposes of summarizing information, the communities are grouped into nine regions which share common culture histories (Fig. 1, Table 2). Descriptions of these regional groupings are contained in Wolfe and Mishler (1993: 15-16).

Selection of Households for Harvest Surveys

In the 60 surveyed communities, systematic interviews were conducted with potential marine mammal hunters living in 2,087 households (Table 2). Households were selected using three main designs, depending upon the community -- census sampling, two-strata random sampling, and chain referral sampling. The type of design used for each community is shown in Table 2. Sampling designs and expansion methods were similar to those used the first study year, as described in Wolfe and Mishler (1993:17-19).

Samolina Fractions and Statistical Analysis

For communities with census or chain referral sampling, 86 percent of identified households (1,048 of 1,219 households) were successfully contacted and interviewed. For communities with two-strata designs, 90 percent of high stratum household were successfully contacted and interviewed (485 of 540 households), while a 21 percent random sample of low stratum households were interviewed (554 of 2,605 households) (Tables 2 and 3).

These are very high sampling fractions for studies using survey methodologies which rely upon voluntary participation by surveyed households.

TABLE 2
SAMPLING METHODOLOGY BY COMMUNITY,
HARBOR SEAL AND SEA LION SURVEYS, 1993

<u>Region and Community</u>	<u>1990 Native Population</u>	<u>Type of Design</u>	<u>Identified Household Universe</u>	<u>Surveyed Households</u>	<u>Percent Households Surveyed</u>
1. SOUTHEAST					
Angoon	525	Two Strata	130	76	58.5%
Craig	288	Chain Referral	25	23	92.0%
Haines	279	Chain Referral	23	20	87.0%
Hoonah	534	Two Strata	155	86	55.5%
Hydaburg	342	Chain Referral	14	14	100.0%
Juneau	3,462	Chain Referral	101	89	88.1%
Kake	514	Two Strata	1 8 8	102	60.7%
Ketchikan	1,814	Chain Referral	19	13	68.4%
Klawock	392	Chain Referral	28	19	67.9%
Klukwan	112	Chain Referral	11	9	81.8%
Pelican	85	Chain Referral	18	15	93.8%
Petersburg	334	Chain Referral	18	8	44.4%
Saxman	284	Two Strata	81	38	62.3%
Sitka	1,797	Two Strata	489	94	19.2%
Wrangell	507	Chain Referral	8	4	66.7%
Yakutat	294	Census	117	106	90.6%
Region Total	11,343		1,361	716	61.6%
2. NORTH PACIFIC RIM					
Chenega Bay	85	Census	21	19	90.5%
Cordova	272	Three Strata	181	28	15.5%
Nanwalek	144	Census	36	33	91.7%
Port Graham	150	Census	59	56	94.9%
Seldovia	48	Two Strata	54	30	55.6%
Seward	410	Two Strata	156	27	17.3%
Tatitlek	103	Census	29	28	96.6%
Valdez	239	Chain Referral	6	6	100.0%
Region Total	1,431		542	227	41.9%
3. UPPER KENAI-COOK INLET					
Anchorage	14,569	Chain Referral	40	36	90.0%
Homer	189	Chain Referral	12	5	41.7%
Kenai	1,715	Chain Referral	2	2	100.0%
Region Total	16,473		54	43	79.6%
4. KODIAK ISLAND					
Akhiok	72	Census	21	19	90.5%
Karluk	85	Census	15	12	80.0%
Kodiak City	811	Two Strata	403	41	10.2%
Larsen Bay	124	Census	43	39	90.7%
Old Harbor	252	Two Strata	81	59	72.8%
Ouzinkie	178	Census	65	60	92.3%
Port Lions	150	Two Strata	59	33	55.9%
Region Total	1,652		667	263	38.3%

TABLE 2 CONTINUED
SAMPLING METHODOLOGY BY COMMUNITY,
HARBOR SEAL AND SEA LION SURVEYS, 1993

<u>Region and Community</u>	<u>1990 Native Population</u>	<u>Type of Design</u>	<u>Identified Household Universe</u>	<u>Surveyed Households</u>	<u>Percent Households Surveyed</u>
5. SOUTH ALASKA PENINSULA					
Chignik Bay	85	Census	25	20	80.0%
Chignik Lagoon	30	Census	16	15	93.8%
Chignik Lake	122	Census	36	26	72.2%
False Pass	52	Census	20	20	100.0%
Ivanof Bay	33	Census	7	6	85.7%
King Cove	177	Two Strata	117	38	32.5%
Perryville	102	Census	31	29	93.5%
Sand Point	433	Two Strata	143	42	29.4%
Region Total	1,034		395	196	49.6%
6. ALEUTIAN ISLANDS					
Akutan	80	Census	29	26	89.7%
Atka	91	Census	24	22	91.7%
Nikolski	29	Census	13	13	100.0%
Unalaska	259	Two Strata	78	61	78.2%
Region Total	469		144	122	84.7%
7. PRIBILOF ISLANDS					
Saint George	131	Census	47	38	80.9%
Saint Paul	504	Two Strata	131	84	54.1%
Region Total	635		176	122	68.5%
8. SOUTH BRISTOL BAY					
Egegik	86	Census	44	40	90.9%
King Salmon	108	Census	28	21	75.0%
Levelock	87	Census	35	26	74.3%
Naknek	236	Two Strata	90	40	44.4%
Pilot Point	45	Census	27	25	92.6%
Port Heiden	86	Census	23	15	65.2%
South Naknek	108	Census	35	33	94.3%
Region Total	756		282	200	70.9%
9. NORTH BRISTOL BAY					
Aleknagik	154	Census	37	23	62.2%
Clark's Point	53	Census	15	15	100.0%
Dillingham	1,125	Two Strata	456	52	11.4%
Manokotak	368	Two Strata	77	41	53.2%
Togiak	535	Two Strata	116	67	57.8%
Region Total	2,235		701	196	26.2%
TOTAL	36,018		4,364	2,087	47.8%
(Excl. Anchorage)	(21,449)		(4,313)	(2,040)	(47.3%)

TABLE 3
SAMPLING METHODOLOGY FOR COMMUNITIES
WITH TWO STRATA DESIGNS,
HARBOR SEAL AND SEA LION SURVEYS, 1993

<u>Community</u>	<u>Number</u> High Stratum <u>Households</u>	<u>Sampled</u> High Stratum <u>Households</u>	<u>Percent</u> High <u>Stratum</u>	<u>Number</u> Low Stratum <u>Households</u>	<u>Sampled</u> Low Stratum <u>Households</u>	<u>Percent</u> Low <u>Stratum</u>
Angoon	47	46	97.9%	83	30	36.1%
Cordova	13	9	69.2%	168	19	11.3%
Dillingham	24	23	95.8%	432	29	8.7%
Hoonah	57	53	93.0%	98	33	33.7%
Kake	78	72	92.3%	90	30	33.3%
King Cove	14	12	85.7%	103	26	25.2%
Kodiak City	10	10	100.0%	393	31	7.9%
Manokotak	11	11	100.0%	66	30	45.5%
Naknek	19	14	73.7%	71	26	36.6%
Old Harbor	28	27	98.4%	53	32	60.4%
Port Heiden	7	7	100.0%	52	28	50.0%
Sand Point	14	12	85.7%	129	30	23.3%
Saxman	10	9	90.0%	51	29	56.9%
Seldovia	5	5	100.0%	49	25	51.0%
Seward	11	9	81.8%	145	16	12.4%
Sitka	71	64	90.1%	418	30	7.2%
Saint Paul	61	53	88.9%	70	31	44.3%
Togiak	36	33	91.7%	80	34	42.5%
<u>Unalaska</u>	<u>24</u>	<u>16</u>	<u>66.7%</u>	<u>54</u>	<u>45</u>	<u>83.3%</u>
Total	540	485	89.8%	2605	554	21.3%

Overall, the level of cooperation by households in the harvest survey was high in all communities. The non-response rate was primarily due to logistical problems in contacting households, rather than refusals to participate.

Harvest information was obtained for all targeted communities except for Saint Paul in the Pribilof Islands region, where surveys were not administered to standards required by the project in 1993. Because of the lack of more recent information, the estimated 1992 subsistence takes at Saint Paul are used as the estimates of the 1993 subsistence takes for both species at Saint Paul in this report.

As stated above, there were two survey rounds, covering the hunting periods of January 1993 through November 1993, and December 1993 through May 1994. In data analysis, information pertaining to December 1994 collected during the second round was linked with the data set collected during the first round on a household basis, to complete the entire 1993 calendar year. A small number of households surveyed during round one were missed during round two, resulting in missing data for December 1993 for some households. To deal with this missing data, an estimate of a household's missing December 1993 subsistence take was based on the household's December 1992 subsistence take, when that information was available; a household's missing December 1993 subsistence take was estimated to be zero when no additional information was available for a household.

In the appendices, the statistical analysis presents harvest data in three different tables for each community. In the first table, the unexpanded reported take is presented for each community. The table of unexpanded numbers represents actual animals reported killed by surveyed hunters, so there are no fractions of animals. The second table presents the combined estimated expanded take for each stratum in the community. In this table, takes of surveyed hunters

are expanded to unsurveyed hunters within the stratum, using different methods depending upon the household sampling design as described above. In this expansion, the proportions of the seasonal takes of the surveyed households are preserved, so takes with unknown months exist in the table. The expansion treats each community as a separate sampling universe. Fractions of animals commonly result from the expansion, which are rounded to the nearest tenth. The third table presents a seasonally adjusted expanded take. In this table, the takes with unknown months are assigned to months based on the proportion of the known take. The numbers in this third table form the basis for the numbers in the report's narrative.

The calculation of the confidence range around the estimate is done for each community separately, as described in Wolfe and Mishler (1993:20-21). The confidence intervals were calculated according to the methods for stratified samples following Cochran (1977:5.13, 5.15). In this process, the unexpanded, reported take was used as the lower range for a community if it was higher than the statistically-calculated lower take estimate. This was done because the unexpanded take represents known (not hypothetical) kills.

THE SUBSISTENCE TAKE OF HARBOR SEAL IN 1993

Estimated Size of the Harbor Seal Take, 1993

The estimated size of the total take of harbor seals (*Phoca vitulina*) by Alaska Natives in 1993 is presented in Tables 4 and 5. In 1993, there were an estimated 2,729 harbor seals taken by Alaska Natives for subsistence uses (with a 95 percent confidence range of between 2,513 to 3,464 animals) (Table 4). Of the 1993 subsistence take, 13.5 percent (369 harbor seals) were struck and lost, and 86.5 percent (2,360 harbor seals) were harvested.

The total state estimate for harbor seals is necessarily somewhat indeterminate because of species identification problems in the Bristol Bay area. As discussed in Wolfe and Mishler (1993:61-69), in Bristol Bay there are areas with a seasonal geographic overlap of *Phoca vitulina* and *Phoca largha*. The indigenous Yup'ik taxonomies categorize adults of the two Linnaean species as a single type (*issuriq*) in this area, and categorize pups into two different types. Of the total North Bristol Bay take, we classified 65 seals as *Phoca vitulina* and 265 as *Phoca largha*, based on ecological features of the kill (degree of association with seasonal ice) (Table 5, Appendix Table B-21). Of the animals classified as *Phoca largha*, 18.9 percent (50 animals) were reported struck and lost, and 81 .1 percent (215 animals) were harvested (Appendix Table B-21). In Table 4, we also assumed the entire South Bristol Bay take of 131 animals was *Phoca vitulina*. Changing these assumptions will change the total statewide take estimate up or down. As stated above, we believe the best estimate of the subsistence take in 1993 is 2,729 harbor seals, based on the assumptions above.

TABLE 4
ESTIMATED SUBSISTENCE TAKES OF
HARBOR SEAL (PHOCA VITULINA) AND
SEA LION (EUMETOPIAS JUBATUS)
BY ALASKA NATIVES, 1992 AND 1993

	<u>Year</u>	<u>Harvest</u>	<u>Struck and Lost</u>	<u>Total Take</u>	<u>Lower and Upper Confidence Range</u>
Harbor Seal	1992	2,525 (88.1%)	342 (11.9%)	2,887 (100.0%)	2,317 - 3,677
	1993	2,360 (86.5%)	369 (13.5%)	2,729 (100.0%)	2,513 - 3,464
Sea Lion	1992	369 (67.3%)	179 (32.7%)	548 (100.0%)	452-711
	1993	348 (71.4%)	139 (28.6%)	487 (100.0%)	391 - 630

Source: Division of Subsistence, Alaska Department of Fish and Game

TABLE 5
REGIONAL DISTRIBUTION OF SUBSISTENCE TAKES OF
HARBOR SEAL (PHOCA VITULINA) BY ALASKA NATIVES, 1993

Region	Harvest	Struck and Lost	Take	Percent	Per Capita Harvest	Struck and Lost Rate
Southeast	1425.1	190.0	1615.1	59.2%	0.11	11.8%
Nor&h Pacific Rim	406.8	37.6	444.3	16.3%	0.27	8.5%
Upper Kenai-Cook Inlet	49.2	5.8	54.8	2.0%	0.27	10.2%
Kodiak Island	171.7	20.1	191.6	7.0%	0.08	10.5%
South Alaska Peninsula	100.0	23.1	123.1	4.5%	0.07	18.8%
Aleutian Islands	85.0	15.4	100.4	3.7%	0.09	15.3%
Pribilof Islands	2.3	1.2	3.5	0.1%	0.00	34.3%
South Bristol Bay	73.6	57.3	130.9	4.8%	0.09	43.8%
North Bristol Bay	46.1	18.9	65.0	2.4%	0.02	29.1%
ALASKA	2359.9	369.0	2728.9	100.0%		13.5%
	(86.5%)	(13.4%)	(100.0%)			

Source: Division of Subsistence, Alaska Department of Fish and Game

TABLE 6
SUBSISTENCE HARBOR SEAL HARVEST, TAKE, AND USE BY ALASKA NATIVES, 1993
WITH CONFIDENCE INTERVALS AND STATISTICAL **RANGES**, BY COMMUNITY

Community	Percent of Native Households Harvesting Harbor Seal	Percent of Native Households Using Harbor Seal	Harbor Seal Harvested	Harbor Seal Struck and Lost	Harbor Total Seal Take	Confidence Interval (+/- %)	Lower Range Estimate	Upper Range Estimate	Harbor Seal Harvested Per Capita
SOUTHEAST									
Angoon	16.3%	47.0%	56.6	9.9	66.5	14.3	60.0	80.9	.13
Craig	-	-	51.1	9.8	60.9	9.7	58.0	70.6	.21
Haines	-	-	23.0	2.3	25.3	7.6	22.0	32.9	.09
Hoonah	35.4%	83.8%	324.4	35.8	360.2	55.5	305.0	415.8	.67
Hydaburg	-	-	14.0	0.0	14.0	0.0	14.0	14.0	.04
Juneau	-	-	59.0	21.6	80.6	19.1	71.0	99.7	.02
Kake	14.2%	60.5%	100.8	15.2	115.9	21.1	107.0	137.8	.23
Ketchikan	-	-	42.4	2.9	45.3	43.1	31.0	88.5	.03
Klawock	-	-	39.8	0.0	39.6	24.5	27.0	64.3	.10
Klukwan	-	-	1.2	0.0	1.2	1.0	1.0	2.2	.01
Pelican	-	-	5.3	1.1	6.4	1.5	6.0	7.9	.10
Petersburg	-	-	4.5	4.5	9.0	13.1	4.0	22.1	.03
Saxman	3.6%	24.6%	5.6	0.0	5.6	2.8	5.0	8.3	.02
Sitka	9.9%	71.6%	109.3	20.6	129.9	54.4	94.0	184.3	.07
Wrangell	-	-	19.5	9.0	28.5	5.6	22.7	34.3	.06
Yakutat	31.1%	93.4%	566.4	57.4	625.8	122.1	567.0	747.9	2.13
NORTH PACIFIC RIM									
Chenega Bay	57.9%	84.2%	60.8	2.2	63.0	15.5	57.0	78.5	.97
Cordova	8.1%	44.7%	147.4	5.5	152.9	67.8	112.0	220.5	.56
Nanwalek	30.3%	97.0%	29.5	3.3	32.7	6.2	30.0	39.0	.23
Port Graham	26.8%	89.3%	31.6	3.2	34.8	4.0	33.0	36.8	.23
Seldovia	11.0%	34.6%	7.9	4.9	12.8	11.0	8.0	23.8	.27
Seward	0.0%	0.8%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Tatitlek	32.1%	92.9%	108.8	14.5	123.3	17.7	119.0	141.0	1.20
Valdez	-	-	21.0	4.0	25.0	0.0	25.0	25.0	.10
UPPER KENAI-COOK INLET									
Anchorage	-	-	24.4	5.6	30.0	9.6	27.0	39.6	.00
Homer	-	-	4.8	0.0	4.8	7.2	2.0	12.0	.03
Kenai	-	-	20.0	0.0	20.0	0.0	20.0	20.0	.01
KODIAK ISLAND									
Akhiok	26.3%	68.4%	13.3	0.0	13.3	3.5	12.0	16.8	.18
Karluk	41.7%	41.7%	10.0	1.3	11.3	4.0	9.0	15.3	.17
Kodiak City	0.2%	26.4%	6.0	1.0	7.0	0.0	7.0	7.0	.01
Larsen Bay	12.8%	33.3%	7.7	5.5	13.2	3.7	12.0	16.9	.11
Old Harbor	40.4%	94.6%	67.6	2.7	70.3	13.5	60.0	83.8	.28
Ouzinkie	30.0%	46.7%	41.2	8.7	49.6	7.5	46.0	57.3	.19
Port Lions	10.2%	28.8%	26.0	1.0	27.0	0.0	27.0	27.0	.18
SOUTH ALASKA PENINSULA									
Chignik Bay	15.0%	20.0%	6.3	5.0	11.3	6.8	9.0	14.1	.13
Chignik Lagoon	20.0%	20.0%	4.3	1.1	5.3	1.5	5.0	6.8	.18
Chignik Lake	19.2%	84.6%	15.2	5.5	20.8	10.3	15.0	31.1	.17
False Pass	30.0%	65.0%	19.0	0.0	19.0	0.0	19.0	19.0	.37
Ivanof Bay	83.3%	83.3%	16.3	4.7	21.0	4.2	18.0	25.2	.64
King Cove	7.0%	8.0%	12.8	3.5	16.3	3.8	14.0	20.1	.09
Perryville	17.2%	85.5%	12.8	2.1	15.0	3.5	14.0	18.4	.15
Sand Point	9.3%	14.7%	13.3	1.2	14.4	10.5	7.0	24.9	.03

TABLE 6, CONTINUED
SUBSISTENCE HARBOR SEAL HARVEST, TAKE, AND USE BY ALASKA NATIVES, 1993
WITH CONFIDENCE INTERVALS AND STATISTICAL RANGES, BY COMMUNITY

Community	Percent of Native Households Harvesting Harbor Seal	Percent of Native Households Using Harbor Seal	Harbor Seal Harvested	Harbor Seal Struck and Lost	Total Harbor Seal Take	Confidence Interval (+/- %)	Lower Range Estimate	Upper Range Estimate	Harbor Seal Harvested Per Capita
ALEUTIAN ISLANDS									
Akutan	23.1%	05.4%	15.6	4.5	20.1	6.1	18.0	26.1	.25
Atka	31.8%	77.3%	32.7	0.0	32.7	7.6	30.0	40.5	.36
Nikolski	23.1%	38.5%	4.0	1.0	5.0	0.0	5.0	5.0	.17
Unalaska	22.7%	93.8%	32.7	9.9	42.6	10.3	32.3	52.9	.16
PRIBILOF ISLANDS									
Saint George	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Saint Paul	1.2%	6.1%	2.3	1.2	3.5	1.4	3.0	4.6	.01
SOUTH BRISTOL BAY									
Egegik	7.5%	30.0%	7.7	3.3	11.0	3.1	10.0	14.1	.13
King Salmon	19.0%	38.1%	21.3	10.7	32.0	21.0	24.0	53.0	.30
Levelock	3.8%	26.9%	2.7	5.4	8.1	5.9	6.0	14.0	.09
Naknek	1.5%	19.7%	2.7	0.0	2.7	2.7	2.0	5.4	.01
Pilot Point	8.0%	16.0%	2.2	0.0	2.2	0.8	2.0	3.0	.05
Port Heiden	40.0%	86.7%	30.7	19.9	50.6	22.0	33.0	72.6	.59
South Naknek	12.1%	42.4%	6.4	18.0	24.4	3.4	23.0	27.8	.23
NORTH BRISTOL BAY*									
Aleknagik	6.7%	91.3%	0.0	0.0	0.0	0.0	3.0	0.0	.00
Clark's Point	6.7%	13.3%	0.0	0.0	0.0	0.0	2.0	0.0	.00
Dillingham	6.0%	29.6%	18.0	4.2	22.2	26.3	33.0	50.5	.02
Manokotak	13.8%	100.0%	3.2	0.0	3.2	3.2	7.0	6.4	.01
Togiak	49.2%	72.2%	24.9	14.7	39.6	10.9	180.0	50.5	.07
ALASKA TOTAL			2359.9	369.0	2726.9	27%	2513.0	3463.9	
SPOTTED SEALS, NORTH BRISTOL BAY*									
Aleknagik	6.7%	91.3%	4.6	0.0	4.6	4.3	3.0	9.1	.03
Clark's Point	6.7%	13.3%	2.0	0.0	2.0	0.0	2.0	2.0	.04
Dillingham	6.0%	29.6%	26.1	0.0	26.1	3.5	25.0	29.6	.02
Manokotak	13.8%	100.0%	7.4	0.0	7.4	4.4	5.0	11.8	.02
Togiak	49.2%	72.2%	174.7	50.2	225.0	53.3	171.6	276.3	.42
TOTAL WITH OTHER SEALS			2575.0	419.3	2994.1	27%	2719.6	3794.7	

* In North Bristol Bay, percent of households harvesting and using "issuriq".

Geographic Distribution of Harbor Seal Takes

Table 5 shows the regional distribution of harbor seal takes by Alaska Natives in 1993. The largest takes in terms of absolute numbers were taken by the Tlingit and Haida of the Southeast region. About 59.2 percent of the statewide take of harbor seals (1,615 animals), were taken by hunters in Southeast Alaska (Table 5). The regions ranked second and third were the North Pacific Rim (444 seals, or 16.3 percent of the statewide take) and Kodiak island (192 seals, or 7.0 percent of the statewide take). The remainder of the statewide harbor seal take (478 animals, or 17.5 percent) was distributed among the other 6 regions.

The geographic distribution of harbor seal takes by community is shown in Table 6 and Fig. 4. Of the top ten communities (in terms of absolute number of harbor seals taken in 1993), six were in the Southeast region, three in the North Pacific Rim region, and one in the Kodiak Island region. The ten top ranking communities were Yakutat (626 seals), Hoonah (360 seals), Cordova (153 seals), Sitka (130 seals), Tatitlek (123 seals), Kake (116 seals), Juneau (81 seals), Old Harbor (70 seals), Angoon (67 seals), and Chenega Bay (63 seals). There were only four surveyed communities with no reported harbor seals taken in 1993 -- Aleknagik, Clark's Point, Seward, and Saint George.

Per capita harvests are the number of harbor seals harvested per Alaska Native living in a community. It is an estimate of the amount harvested per person in an area, controlling for differences in population size. The top ten communities in terms of harvests per capita in 1993 were Yakutat (2.13 harbor seals harvested per person), Tatitlek (1.201, Chenega Bay (0.971, Hoonah (0.671, Ivanof Bay (0.64), Port Heiden (0.591, Cordova (0.561, False Pass (0.371, Atka (0.361, King Salmon (0.301, and Old Harbor (0.28). In terms of per capita harvests, there was greater parity across regions in harbor seal harvests (Table 6). Among the top ten communities, three were in the North Pacific Rim region, three were in the South

Alaska Peninsula region, and one each was in the Southeast, Kodiak Island, South Bristol Bay and Aleutian Islands regions.

Seasonal Distribution of Harbor Seal Takes

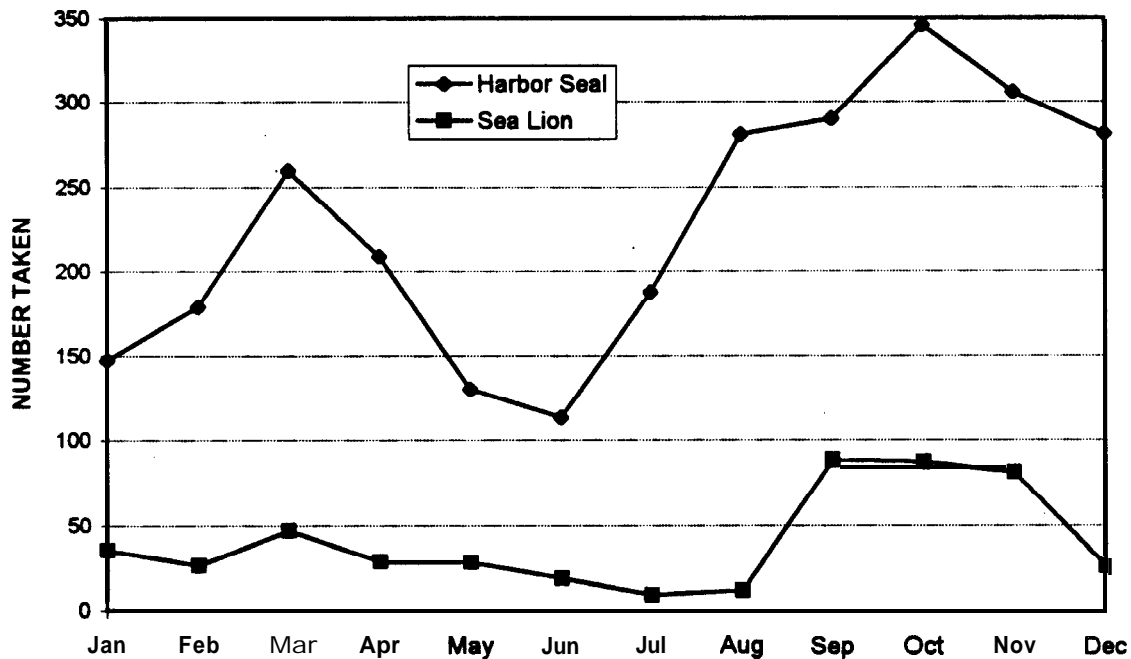
The seasonal distribution of the statewide harbor seal take in 1993 is depicted in Fig. 5. Harbor seals were reported killed during every month of 1993. Two distinct seasonal peaks in subsistence takes are apparent -- during spring (about March and April) and during late summer to early winter (August through December). The months of lowest productivity were January-February and May-June.

The statewide total masks differences in seasonal patterns between regions and communities. The regional seasonal patterns are depicted in Appendix B. The community seasonal patterns are depicted in Appendix C. Factors associated with seasonal takes are discussed in Wolfe and Mishler (1993:32-33).

Age and Sex Distribution of Harbor Seal Harvests

The estimated age and sex distributions of the 1993 harbor seal harvests are shown in Tables 7 and 8 by geographic region. Hunters reported harvesting male harbor seals over female harbor seals by a ratio of about 2.4 to 1. Hunters also reported harvesting substantially more adult harbor seals than juveniles or pups (5.5 to 1). Overall, adult females comprised about 26 percent of the total known harvest of harbor seals in 1993. It is noteworthy that hunters did not report the sex for about 35 percent of the harvest or the age for about 11 percent of the harvest. The age and sex also are unknown for animals which were struck and lost.

Fig 5.
Seasonally Adjusted Takes of
Harbor Seal and Sea Lion
By Alaska Natives, 1993



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Harbor Seal	147.6	178.8	259.5	208.5	130.3	113.2	187.6	280.7	290.1	346	305.8	280.8
Percent	5.4%	6.6%	9.5%	7.6%	4.8%	4.1%	6.9%	10.3%	10.6%	12.7%	11.2%	10.3%
Cum. Percent	5.4%	12.0%	21.5%	29.1%	33.9%	38.0%	44.9%	55.2%	65.8%	78.5%	89.7%	100.0%

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sea Lion	35.3	26.2	46.8	28.4	28.1	18.7	9	11.6	88.5	87.3	81.4	25.8
Percent	7.2%	5.4%	9.6%	5.8%	5.8%	3.8%	1.8%	2.4%	18.2%	17.9%	16.7%	5.3%
Cum. Percent	7.2%	12.6%	22.2%	28.1%	33.8%	37.7%	39.5%	41.9%	60.1%	78.0%	94.7%	100.0%

TABLE 7
AGE AND SEX DISTRIBUTION
OF HARBOR SEAL HARVESTS
BY ALASKA NATIVES, 1993

	Male	Female	Unknown Sex	Total
Adult	908.6	388.4	480.6	1777.6
Row Percent	51.1%	21.8%	27.0%	100.0%
Column Percent	84.5%	87.0%	57.4%	75.3%
Juvenile	148.9	44.6	94.1	287.6
Row Percent	51.8%	15.5%	32.7%	100.0%
Column Percent	13.8%	10.0%	11.2%	12.2%
Pup	5.4	6.6	20.8	32.8
Row Percent	16.5%	20.1%	63.4%	100.0%
Column Percent	0.5%	1.5%	2.5%	1.4%
UnknownAge	13.0	6.6	242.4	262.0
Row Percent	5.0%	2.5%	92.5%	100.0%
Column Percent	1.2%	1.5%	28.9%	11.1%
Total	1075.9	446.2	837.9	2360.0
Row Percent	45.6%	18.9%	35.5%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

TABLE 8
AGE AND SEX DISTRIBUTION OF HARBOR SEAL HARVESTS
BY ALASKA NATIVES BY REGION, 1993

AGE AND SEX	Southeast	Upper North		Cook	Kodiak	South Alaska		South North		Alaska
		Pacific	Kenai-			Aleutian	Pribilof	Bristol	Bristol	
		Rim	Inlet	Island	Peninsula	Islands	Islands	Bay	Bay	
Adult Male	642.2	145.0	5.6	54.4	27.4	23.4	0.0	2.7	7.9	908.6
Adult Female	296.0	60.3	2.4	12.7	2.2	11.1	0.0	1.5	2.2	388.4
Adult Unknown Sex	240.4	73.6	23.3	25.1	35.0	0.0	1.2	57.1	24.9	480.6
Juvenile Male	35.4	36.2	1.1	41.7	4.8	20.7	1.2	3.3	4.5	148.9
Juvenile Female	12.3	9.7	1.1	8.9	2.3	7.9	0.0	0.0	2.4	44.6
Juvenile Unknown Sex	34.1	27.0	0.0	11.6	15.2	3.0	0.0	1.1	2.1	94.1
Pup Male	1.1	1.1	0.0	1.1	0.0	1.1	0.0	0.0	1.0	5.4
Pup Female	0.0	1.1	0.0	0.0	0.0	5.5	0.0	0.0	0.0	6.6
Pup Unknown Sex	13.3	2.2	0.0	1.0	4.3	0.0	0.0	0.0	0.0	20.8
Male Unknown Age	4.4	7.1	0.0	0.0	0.0	1.5	0.0	0.0	0.0	13.0
Female Unknown Age	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	6.6
Unknown Age and Sex	145.9	43.5	15.7	8.7	8.7	10.9	0.0	8.0	1.0	242.4
TOTAL	1425.1	406.8	49.2	171.8	99.9	85.1	2.4	73.7	46.0	2360.0
AGE ONLY										
Adult	1178.6	278.9	31.3	92.2	64.6	34.5	1.2	61.3	35.0	1777.6
Juvenile	81.8	72.9	2.2	62.2	22.3	31.6	1.2	4.4	9.0	287.6
Pup	14.4	4.4	0.0	2.1	4.3	6.6	0.0	0.0	1.0	32.8
Unknown Age	150.3	50.6	15.7	15.3	8.7	12.4	0.0	8.0	1.0	262.0
TOTAL	1425.1	406.8	49.2	171.8	99.9	85.1	2.4	73.7	46.0	2360.0
SW ONLY										
Male	683.1	189.4	6.7	97.2	32.2	46.7	1.2	6.0	13.4	1075.9
Female	308.3	71.1	3.5	28.2	4.5	24.5	0.0	1.5	4.6	446.2
Unknown Sex	433.7	146.3	39.0	46.4	63.2	13.9	1.2	66.2	28.0	837.9
TOTAL	1425.1	406.8	49.2	171.8	99.9	85.1	2.4	73.7	46.0	2360.0

THE SUBSISTENCE TAKE OF SEA LION IN 1993

Estimated Size of the Sea Lion Take. 1993

The estimated size of the total take of Steller sea lions by Alaska Natives in 1993 is presented in Tables 4 and 9. In 1993, there were an estimated 487 sea lions taken by Alaska Natives for subsistence uses (with a 95 percent confidence range of between 391 to 630 animals) (Table 4). Of the 1993 subsistence take, 28.6 percent (139 sea lions) were struck and lost, and 71.4 percent (348 sea lions) were harvested.

Geographic Distribution of Sea Lion Takes

Table 9 shows the regional distribution of sea lion takes in 1993 by Alaska Natives. By far, the largest takes in terms of absolute numbers were taken by the Aleut hunters of the Aleutian Islands region and Pribilof Islands region, about 75.7 percent of the total statewide take of sea lions (369 animals) (Table 9). Other significant takes of sea lions were made by the Alutiiq of the Kodiak Island region (59 animals, or 12.0 percent of the statewide take) and the North Pacific Rim area (35 sea lions, or 7.2 percent of the statewide take). The remainder of the statewide take (25 animals, or 5.1 percent) was distributed among the other 5 regions.

The geographic distribution of sea lion takes by community is shown in Table 10 and Fig. 6. The prominence of the Aleutian and Pribilof areas is again demonstrated in these graphics. Five of the six of Aleutian Islands and Pribilof Islands communities were in the top ten communities in terms of absolute number of sea lions taken in 1993. The five top ranking communities were Saint Paul (227 sea lions), Unalaska (69 sea lions), Old Harbor (33 sea lions), Atka (25 sea lions),

TABLE 9
REGIONAL DISTRIBUTION OF SUBSISTENCE TAKES OF
SEA LION (EUMETOPIAS JUBATUS) BY ALASKA NATIVES, 1993

Region	Harvest	Struck and Lost	Take	Percent	Per Capita Harvest	Struck and Lost Rate
Southeast	0.0	1.1	1.1	0.2%	0.00	100.0%
North Pacific Rim	26.5	8.8	35.2	7.2%	0.02	25.0%
Upper Kenai-Cook Inlet	7.8	3.3	11.1	2.3%	0.04	29.7%
Kodiak Island	41.6	16.9	58.5	12.0%	0.02	28.9%
South Alaska Peninsula	4.6	1.2	5.7	1.2%	0.00	21.1%
Aleutian Islands	99.0	24.8	123.8	25.4%	0.24	20.0%
Pribilof Islands	165.4	80.0	245.4	50.3%	0.25	32.0%
South Bristol Bay	0.0	0.0	0.0	0.0%	0.00	0.0%
North Bristol Bay	3.3	3.3	6.5	1.3%	0.00	50.8%
ALASKA	348.0	139.4	487.4	100.0%		28.6%
	(71.4%)	(28.6%)	(100.0%)			

Source: Division of Subsistence, Alaska Department of Fish and Game

and Akutan (23 sea lions). The top five communities accounted for 77 percent of the total Alaska take (377 sea lions). In 1993, 39 of 60 surveyed communities reported no sea lions taken. Six more communities reported a take of less than 5 sea lions. Only 15 communities had harvests of 5 or more sea lions in 1993.

In terms of per capita harvests, the communities of the Aleutian Islands and Pribilof Islands clearly stand out, with about one-quarter of a sea lion harvested per person in 1993 (Table 9). None of the other regions are close to this. The top six communities in per capita harvests were Saint Paul (0.45 sea lions harvested per person), followed by Akutan (0.291, Atka (0.281, Unalaska (0.271, Chenega Bay (0.27) (in the North Pacific Rim region), and Nikolski (0.21) (Table 10).

Seasonal Distribution of Sea Lion Takes

The seasonal distribution of the statewide sea lion take in 1993 is depicted in Fig. 5. Sea lions were reported killed during every month of 1993. Seasonal peaks in productivity occurred during September through November, while summer (June, July, and August) was the period of lowest productivity.

The statewide total masks differences in seasonal patterns between regions and communities. The regional seasonal patterns are depicted in Appendix B. The community seasonal patterns are depicted in Appendix C. The seasonal patterns of sea lion takes varied substantially between Aleut communities in 1993, as shown in Appendix C.

Age and Sex Distribution of Sea Lion Harvests

The reported age and sex distributions of the 1993 sea lion harvests are shown in Tables 11 and 12 by geographic region. Hunters reported harvesting male sea lions over female sea lions by a ratio of about 4.6 to 1. Hunters also reported harvesting juvenile sea lions over adults and pups by about 1.5 to 1. Adult females

TABLE 10
SUBSISTENCE SEA LION HARVEST, TAKE, AND USE BY ALASKA NATIVES, 1993
WITH CONFIDENCE INTERVALS AND STATISTICAL RANGES, BY COMMUNITY

Community	Percent of Native Households Harvesting Sea Lion	Percent of Native Households using Sea Lion	Sea Lion Harvested	Sea Lion Struck and Lost	Total Sea Lion Take	Confidence Interval (+/- %)	Lower Range Estimate	Upper Range Estimate	Sea Lion Harvested Per Capita
SOUTHEAST									
Angoon	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Craig	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Haines	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Hoonah	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Hydaburg	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Juneau	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Kake	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Ketchikan	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Klawock	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Klukwan	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Pelican	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Petersburg	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Saxman	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Sitka	0.0%	0.5%	0.0	1.1	1.1	0.7	1.0	1.8	.00
Wrangell	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Yakutat	0.0%	0.9%	0.0	0.0	0.0	0.0	0.0	0.0	.00
NORTH PACIFIC RIM									
Chenega Bay	26.3%	63.2%	11.1	6.6	17.7	4.7	16.0	22.4	.27
Cordova	0.8%	0.8%	1.5	0.0	1.5	1.7	1.0	3.2	.01
Nanwalek	12.1%	81.8%	8.7	1.1	9.8	2.8	9.0	12.7	.07
Port Graham	1.8%	12.5%	1.1	0.0	1.1	0.5	1.0	1.5	.01
Seldovia	0.0%	3.6%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Seward	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Tatitlek	7.1%	10.7%	4.1	1.0	5.2	1.5	5.0	6.7	.05
Valdez	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
UPPER KENAI-COOK INLET									
Anchorage	-	-	7.8	3.3	11.1	3.2	10.0	14.3	.00
Homer	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
Kenai	-	-	0.0	0.0	0.0	0.0	0.0	0.0	.00
KODIAK ISLAND									
Akhiok	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Karluk	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Kodiak City	0.0%	9.7%	0.0	12.7	12.7	23.8	1.0	36.5	.02
Larsen Bay	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Old Harbor	27.4%	93.3%	32.1	1.0	33.2	5.6	29.0	38.8	.13
Ouzinkie	5.0%	6.7%	5.4	2.2	7.6	2.7	7.0	10.3	.03
Port Lions	6.8%	6.8%	4.0	1.0	5.0	2.8	4.0	7.8	.03

TABLE 10, CONTINUED
 SUBSISTENCE SEA LION HARVEST, TAKE, AND USE BY ALASKA NATIVES, 1993
 WITH CONFIDENCE INTERVALS AND STATISTICAL RANGES, BY COMMUNITY

Community	Percent of Native Households Harvesting Sea Lion	Percent of Native Households Using Sea Lion	Sea Lion Harvested	Sea Lion Struck and Lost	Total Sea Lbn T a k e	Confidence Interval (+/- %)	Lower R a n g e Estimate	Upper R a n g e Estimate	Sea Lion Harvested Per Capita
SOUTH ALASKA PENINSULA									
Chignik Bay	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Chignik Lagoon	6.7%	6.7%	1.1	0.0	1.1	0.5	1.0	1.6	.04
Chignik Lake	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
False Pass	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Ivanof Bay	33.3%	50.0%	2.3	1.2	3.5	1.8	3.0	5.3	.11
King Cove	1.0%	3.0%	1.2	0.0	1.2	0.9	1.0	2.0	.01
Perryville	0.0%	6.9%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Sand Point	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
ALEUTIAN ISLANDS									
Akutan	23.1%	88.5%	14.5	8.9	23.4	5.7	21.0	29.2	.29
Atka	36.4%	86.4%	25.1	0.0	25.1	5.4	23.0	30.5	.28
Nikolski	23.1%	100.0%	6.0	0.0	6.0	0.0	6.0	6.0	.21
Unalaska	22.7%	100.0%	53.4	15.9	69.3	25.3	47.0	94.6	.27
PRIBILOF ISLANDS									
Saint George	7.9%	36.8%	3.7	14.8	18.6	7.1	15.0	25.6	.14
Saint Paul	37.6%	83.5%	161.7	65.2	226.8	43.4	183.5	270.2	.45
SOUTH BRISTOL BAY									
Egegik	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
King Salmon	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Levelock	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Naknek	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Pilot Point	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Port Heiden	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
South Naknek	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
NORTH BRISTOL BAY									
Aleknagik	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Clark's Point	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Dillingham	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Manokotak	0.0%	37.7%	0.0	0.0	0.0	0.0	0.0	0.0	.00
Togiak	1.9%	5.6%	3.3	3.3	6.5	2.3	6.0	8.8	.01
ALASKA TOTAL			348.0	139.4	487.4	29%	390.5	629.7	

**TABLE 11
AGE AND SEX DISTRIBUTION
OF SEA LION HARVESTS
BY ALASKA NATIVES, 1993**

	Male	Female	Unknown Sex	Total
Adult	70.5	26.0	10.3	106.8
Row Percent	66.0%	24.3%	9.6%	100.0%
Column Percent	31.2%	52.4%	14.2%	30.7%
Juvenile	138.4	19.1	43.2	200.7
Row Percent	69.0%	9.5%	21.5%	100.0%
Column Percent	61.2%	38.5%	59.0%	57.7%
Pup	16.0	4.5	4.6	25.1
Row Percent	63.7%	17.9%	18.3%	100.0%
Column Percent	7.1%	9.1%	6.4%	7.2%
Unknown Age	1.1	0.0	14.2	15.3
Row Percent	7.2%	0.0%	92.8%	100.0%
Column Percent	0.5%	0.0%	19.6%	4.4%
Total	226	49.6	72.3	347.9
Row Percent	65.0%	14.3%	20.8%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

TABLE 12
AGE AND SEX DISTRIBUTION OF SEA LION HARVESTS
BY ALASKA NATIVES BY REGION, 1993

AGE AND SEX	Southeast	Upper			South			South North		Alaska
		Pacific	Kenai-		Alaska	Aleutian	Pribilof	Bristol	Bristol	
		Rim	Inlet	Island	Peninsula	Islands	Islands	Bay	Bay	
Adult Male	0.0	5.5	2.2	13.6	1.1	38.9	9.2	0.0	0.0	70.5
Adult Female	0.0	1.1	2.2	6.2	0.0	16.5	0.0	0.0	0.0	26.0
Adult Unknown Sex	0.0	5.9	1.1	1.0	0.0	0.0	1.2	0.0	1.1	10.3
Juvenile Male	0.0	4.3	1.1	15.2	0.0	14.6	102.1	0.0	1.1	138.4
Juvenile Female	0.0	3.3	0.0	0.0	1.2	13.4	1.2	0.0	0.0	19.1
Juvenile Unknown Sex	0.0	2.2	0.0	2.2	2.3	1.1	34.3	0.0	1.1	43.2
Pup Male	0.0	0.0	0.0	0.0	0.0	4.5	11.5	0.0	0.0	16.0
Pup Female	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	4.5
Pup Unknown Sex	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Male Unknown Age	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Female Unknown Age	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Age and Sex	0.0	4.2	0.0	3.3	0.0	5.5	1.2	0.0	0.0	14.2
TOTAL	0.0	26.5	7.7	41.5	4.6	99.0	165.3	0.0	3.3	347.9
AGE ONLY										
Adult	0.0	12.5	5.5	20.8	1.1	55.4	10.4	0.0	1.1	106.8
Juvenile	0.0	9.8	1.1	17.4	3.5	29.1	137.6	0.0	2.2	200.7
Pup	0.0	0.0	0.0	0.0	0.0	9.0	16.1	0.0	0.0	25.1
Unknown Age	0.0	4.2	1.1	3.3	0.0	5.5	1.2	0.0	0.0	15.3
TOTAL	0.0	26.5	7.7	41.5	4.6	99.0	165.3	0.0	3.3	347.9
SEX ONLY										
Male	0.0	9.8	4.4	28.8	1.1	58.0	122.8	0.0	1.1	226.0
Female	0.0	4.4	2.2	6.2	1.2	34.4	1.2	0.0	0.0	49.6
Unknown Sex	0.0	12.3	1.1	6.5	2.3	6.6	41.3	0.0	2.2	72.3
TOTAL	0.0	26.5	7.7	41.5	4.6	99.0	165.3	0.0	3.3	347.9

comprised about 9 percent of the total known harvest of sea lions in 1993. Hunters did not report the sex for 21 percent of the harvest or age for about 5 percent of the harvest. The age and sex also are unknown for sea lions which were struck and lost.

HUNTING PARTICIPATION

Hunting harbor seal or sea lion is a relatively specialized subsistence activity in Alaska communities. Based on survey findings, the estimated number of households which reported at least one member hunting harbor seal was 1,014 households in 1992 and 853 households in 1993. The estimated number of households which reported at least one member hunting sea lions was 1 99 households in 1992 and 223 households in 1993. For both survey years, the large majority of Native households in the study's sampling universe did not attempt to hunt harbor seals or sea lions (Table 13). This suggests that only a minority of Native households probably will hunt harbor seals or sea lions on any given year.

There also was substantial specialization in hunter productivity among the households that did hunt in 1993 (see Figs. 7 and 8). About 30 percent of the households which hunted harbor seal killed 78 percent of the animals taken in 1993 (Fig. 7). Similarly, about 30 percent of the households which hunted sea lion killed 73 percent of the animals taken in 1993 (Fig. 8). This shows that a relatively small number of highly-productive hunters reported taking most of the subsistence kills. For harbor seal and sea lion, about one-quarter of hunting households reported hunting unsuccessfully each year (from 22 percent to 26 percent; see Table 13).

There appears to be moderate turnover in hunting households across years. To assess the variability in the composition of the hunters from one year to the next, a comparison was made of 1,274 households which were interviewed in both 1992 and 1993, shown as unweighted numbers in Table 14. For harbor seal, there

**TABLE 13
PARTICIPATION RATES OF
ALASKA NATIVE HOUSEHOLDS IN
HUNTING HARBOR SEAL OR SEA LION, 1992 AND 1993**

	HARBOR SEAL			SEA LION		
	<u>Household Universe</u>	<u>Percent Household of Universe</u>	<u>Percent Household of Hunting Households</u>	<u>Household Universe</u>	<u>Percent Household of Universe</u>	<u>Percent Household of Hunting Households</u>
STUDY YEAR 1992						
Did Not Hunt	2,098	73%	--	3,513	95%	--
Hunted Unsuccessfully	282	7%	26%	49	1%	25%
Hunted Successfully	752	20%	74%	150	4%	75%
Total Households	3,712	100%	--	3,712	100%	--
Total Hunting Households	1,014	--	100%	199	--	100%
STUDY YEAR 1993						
Did Not Hunt	3,510	80%	--	4,142	95%	--
Hunted Unsuccessfully	188	4%	22%	52	1%	23%
Hunted Successfully	665	15%	78%	171	4%	77%
Total Households	4,364	100%	--	4,364	100%	--
Total Hunting Households	853	--	100%	223	--	100%

Fig 7.
Specialization In Harbor Seal Takes:
Percent of Hunters by Percent of Take, 1993

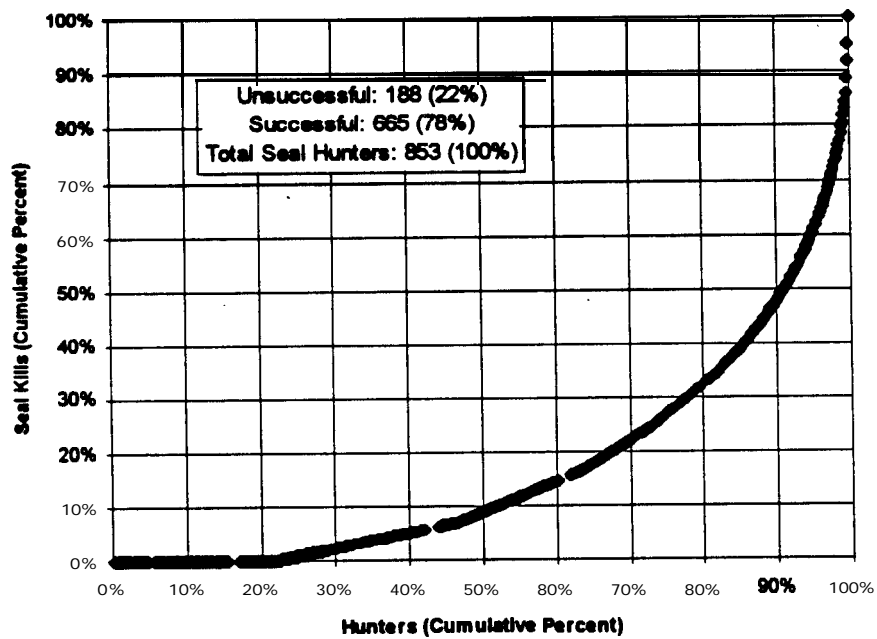
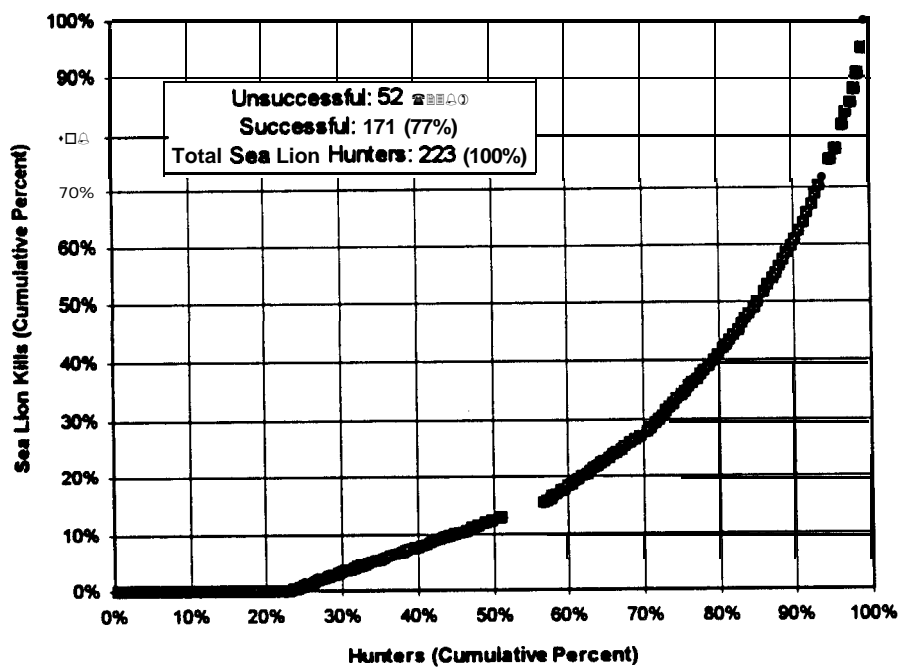


Fig. 8.
Specialization In Sea Lion Takes:
Percent of Hunters by Percent of Take, 1993



were 187 households that hunted in 1992 but not in 1993, and 118 households that hunted in 1993 but not in 1992 (a net decrease of 69 households). There were 336 households that hunted harbor seal in both 1992 and 1993. For sea lion, there were 31 households that hunted in 1992 but not in 1993, and 48 households that hunted in 1993 but not 1993 (a net increase of 17 households). There were 57 households that hunted in both 1992 and 1993. Hunter participation is shown separately for St. Paul, where only a single year's data 'are available (Table 14).

DISCUSSION

A limitation of single-year hunter surveys is that they cannot provide information on the ranges or trends of harvests over time. Subsistence harvests tend to be dynamic, changing over time due to a number of ecological, economic, and cultural factors. As discussed in Wolfe and Mishler (1993:71-89), there are several indications that the current statewide subsistence takes of harbor seal and sea lion are lower in comparison with subsistence takes in the recent past. Factors associated with recent lower takes include the mistaken belief that sea lions are closed by regulation to subsistence hunting in certain areas, particularly the Kodiak Island and Alaska Peninsula areas; the continuing effects of the 1989 *Exxon Valdez* oil spill in Prince William Sound; and the apparent general declining trends in population sizes of harbor seals and sea lions from the Gulf of Alaska westward (see Wolfe and Mishler 1993). The current subsistence takes of harbor seals are considerably lower than kills during the period from 1927-72 when a hair seal bounty program was operated by the territorial or state government (Wolfe and Mishler 1993: Addendum to Appendix B). During the 1950s, the reported numbers of hair seals (primarily harbor seals) killed ranged between about 15,000 to 20,000 animals annually in Alaska.

TABLE 14
COMPARISON OF HOUSEHOLDS
INTERVIEWED IN BOTH 1992 AND 1993
(UNWEIGHTED NUMBERS)

HARBOR SEAL

COMMUNITIES WITH TWO YEARS OF DATA

1,274 Households interviewed in both 1992 and 1993
 833 Households did not hunt in 1992 and 1993
 187 Households hunted in 1992 but not in 1993
 50 Households hunted unsuccessfully in 1992
 137 Households hunted successfully in 1992
 118 Households hunted in 1993 but not in 1992
 36 Households hunted unsuccessfully in 1993
 82 Households hunted successfully in 1993
 336 Households hunted in 1992 and 1993
 19 Households hunted unsuccessfully in 1992 and 1993
 27 Households hunted successfully in 1992 but unsuccessfully in 1993
 24 Households hunted successfully in 1993 but unsuccessfully in 1992
 266 Households hunted successfully in 1992 and 1993

ST. PAUL (SINGLE YEAR OF DATA)

84 Households interviewed in 1992
 80 Households did not hunt in 1992
 4 Households hunted in 1992
 1 Households hunted unsuccessfully in 1992
 3 Households hunted successfully in 1992

SEA LION

COMMUNITIES WITH TWO YEARS OF DATA

1,274 Households interviewed in both 1992 and 1993
 1,138 Households did not hunt in 1992 and 1993
 31 Households hunted in 1992 but not in 1993
 13 Households hunted unsuccessfully in 1992
 18 Households hunted successfully in 1992
 48 Households hunted in 1993 but not in 1992
 21 Households hunted unsuccessfully in 1993
 27 Households hunted successfully in 1993
 57 Households hunted in 1992 and 1993
 4 Households hunted unsuccessfully in 1992 and 1993
 5 Households hunted successfully in 1992 but unsuccessfully in 1993
 6 Households hunted successfully in 1993 but unsuccessfully in 1992
 42 Households hunted successfully in 1992 and 1993

ST. PAUL (SINGLE YEAR OF DATA)

84 Households interviewed in 1992
 36 Households did not hunt in 1992
 48 Households hunted in 1992
 8 Households hunted unsuccessfully in 1992
 40 Households hunted successfully in 1992

In the following sections, the estimated subsistence takes in 1993 are compared with takes in previous years, where estimates exist. The comparisons allow for assessments of the relative continuity and change of subsistence takes between years at the state, region, and community levels. In addition, by comparing subsistence information collected in 1992 and 1993, an assessment can be made of the relative success of the network of local and regional researchers as a subsistence harvest collection method.

Comparisons of Annual Subsistence Takes

At the state level, the estimates of the subsistence takes of harbor seal and sea lion were relatively similar in 1992 and 1993. The estimated statewide subsistence takes of harbor seal in 1992 (2,867 seals) and 1993 (2,729 seals) differed by 138 animals (4.8 percent) (Table 4). The estimated statewide subsistence takes of sea lion in 1992 (548 sea lions) and 1993 (487 sea lions) reflect a difference of 61 animals (11.1 percent) between 1992 and 1993 (Table 4). The differences between the two years are not statistically significant for the harbor seal estimates or for the sea lion estimates. The estimated total takes in 1993 fall within the confidence ranges of the 1992 estimates for each species (see Table 4). Therefore, looking at the state as a whole, there appear to have been no major changes in the levels of subsistence takes of harbor seal or sea lion between 1992 and 1993.

Seasons of harvests for 1992 and 1993 are shown in Fig. 9. The two seasonal peaks in harbor seal harvests during spring and fall, and the mid-summer low in harbor seal harvests, are similar in both 1992 and 1993. The fall harvest of harbor seal seems to have occurred somewhat earlier in 1993 than in 1992, peaking in October instead of November. The seasons of the sea lion harvests are also similar, although there appears to be fewer animals taken in winter (December

Fig. 9.
Estimated Seasonally Adjusted Takes of Harbor Seal
by Alaska Natives, 1992 and 1993

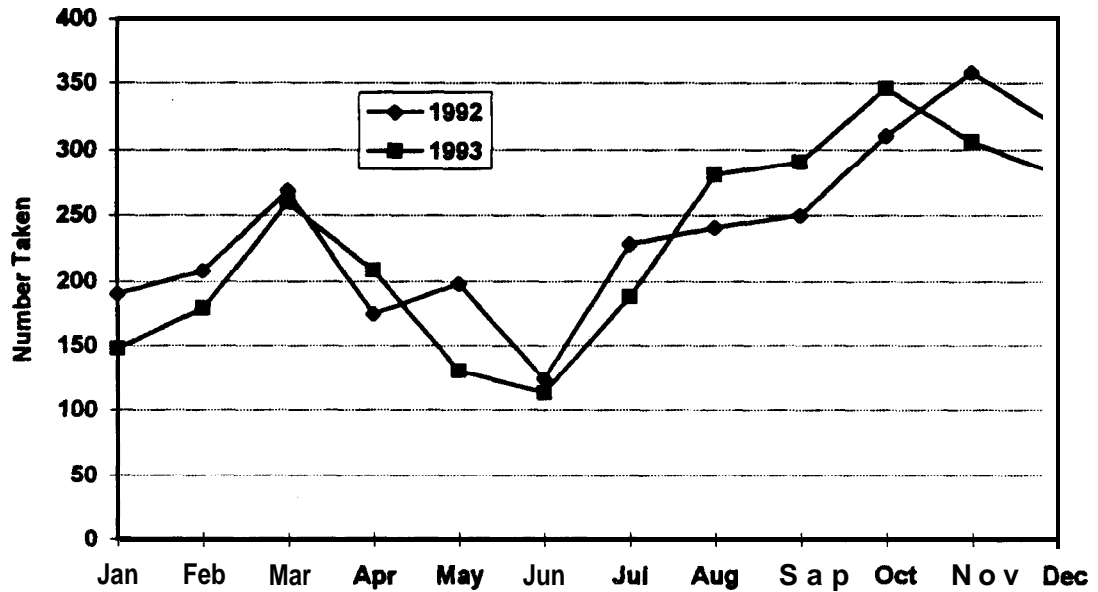
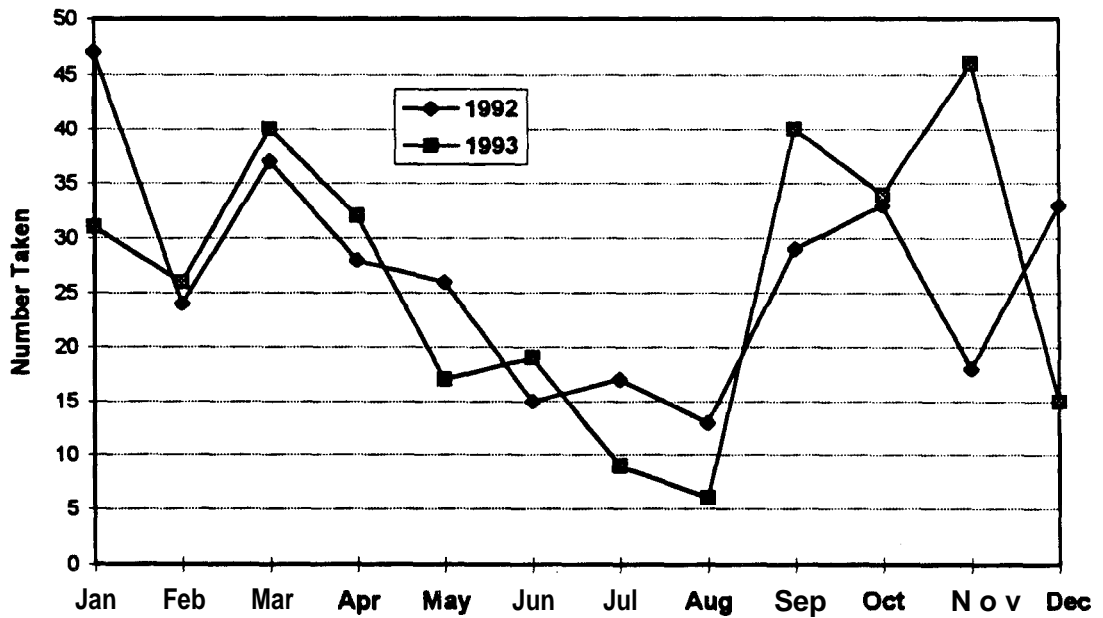


Fig. 10.
Estimated Seasonally Adjusted Takes of Sea Lion
by Alaska Natives, 1992 and 1993 (Excluding St. Paul)



and January) during 1993 in comparison with 1992, and more during November. The seasonal takes at St. Paul were removed from the two comparison years because of the lack of seasonal data in 1993.

Relative struck and lost rates were similar between years for harbor seals (12 percent in 1992 and 14 percent in 1993) and for sea lion (33 percent in 1992 and 29 percent in 1993) (see Table 4). Considering kills of known sex, male to female sex ratios were similar between years for harbor seal (2.2 to 1 in 1992, compared with 2.4 to 1 in 1993). For sea lion, there was an apparent increase in male to female sex ratios (3.3 to 1 in 1992, compared with 4.6 to 1 in 1993). The reason for this difference is not known.

A comparison of regional subsistence takes are presented in Table 15. Like the statewide estimates, the estimates of regional takes appear to be relatively consistent between 1992 and 1993 for harbor seal and sea lion.

By contrast, subsistence takes at the community level display a more complex picture, as shown in Tables 16 and 17. Depending upon the community, increases, decreases, and no apparent changes in subsistence takes were documented. For instance, in the North Pacific Rim area, harbor seal take estimates increased in four communities (Chenega Bay, Cordova, Nanwalek, and Valdez), declined in two communities (Port Graham and Tatitlek), and were virtually identical in two communities (Seldovia and Seward). In aggregate, the estimated regional take was almost unchanged between 1992 and 1993, showing a difference of 3 percent (13 animals more).

As another example, in the Southeast region, 14 of 16 communities had lower estimated takes of harbor seals in 1993 compared with 1992, suggesting a decrease in subsistence takes of harbor seals for most communities in the region as a whole between 1992 and 1993. However, subsistence take estimates doubled from 1992 to 1993 in the two remaining southeast communities (Wrangell

TABLE 15
SUBSISTENCE TAKES OF HARBOR SEAL AND SEA LION
BY ALASKA NATIVES BY REGION, 1992 AND 1993

Region	1992	1992	1992	1993	1993	1993
	Harbor Seal Harvested	Harbor Seal Struck and Lost	Total Harbor Seal Take	Harbor Seal Harvested	Harbor Seal Struck and Lost	Total Harbor Seal Take
Southeast	1481.3	189.4	1670.7	1425.1	190.0	1615.1
North Pacific Rim	397.4	33.4	430.8	406.8	37.6	444.3
Upper Kenai-Cook Inlet	51.6	0.0	51.6	49.2	5.6	54.8
Kodiak Island	225.5	15.6	241.1	171.7	20.1	191.8
South Alaska Peninsula	115.5	13.1	128.6	100.0	23.1	123.1
Aleutian Islands	94.3	21.4	115.7	85.0	15.4	100.4
Pribilof Islands	2.3	1.2	3.5	2.3	1.2	3.5
South Bristol Bay	99.0	55.1	154.1	73.6	57.3	130.9
North Bristol Bay	57.6	13.1	70.7	46.1	18.9	65.0
Alaska Total	2524.5	342.3	2866.8	2359.9	369.0	2728.9

Region	1992	1992	1992	1993	1993	1993
	Sea Lion Harvested	Sea Lion Struck and Lost	Total Sea Lion Take	Sea Lion Harvested	Sea Lion Struck and Lost	Total Sea Lion Take
southeast	5.2	1.3	6.4	0	1.1	1.1
North Pacific Rim	23.9	6.5	30.4	26.5	8.8	35.2
Upper Kenai-Cook Inlet	5.7	3.8	9.5	7.8	3.3	11.1
Kodiak Island	41.5	16.4	57.8	41.6	16.9	58.5
South Alaska Peninsula	2.4	0	2.4	4.6	1.2	5.7
Aleutian Islands	104.3	30.9	135.2	99	24.8	123.8
Pribilof Islands	176.5	120.2	296.7	165.4	80	245.4
South Bristol Bay	0	0	0	0	0	0
North Bristol Bay	7.8	0	7.8	3.3	3.3	6.5
Lake Iliamna	1.3	0	1.3	-	-	-
Alaska Total	368.6	179.0	547.5	348.0	139.4	487.4

and Yakutat). In aggregate, the subsistence take estimates for the Southeast region were almost unchanged between 1992 and 1993, showing a difference of 3 percent (56 fewer animals). For sea lion, differences among communities also are complex, with some communities showing increased takes (e.g., Chenega Bay, Nanwalek, and Unalaska) and others showing decreased takes (e.g., Tatitlek, Old Harbor, and Atka). The largest difference in reported takes between 1992 and 1993 was at Saint George (from 70 animals to 19 animals).

These comparisons suggest variability in subsistence takes across years at the community level due to a local ecological, economic, and cultural factors. These local factors probably include weather conditions during harvest seasons, availability of animals to hunters, level of seasonal employment in communities affecting hunter participation, health of key hunters, household and community food requirements, and social obligations to provide food connected with funeral observances, among other variables. Causal explanations for any one community's harvest change are likely to be specific to that place and year, and not necessarily applicable to any other set of communities. No simple generalizations can be made comparing 1992 and 1993 subsistence takes at the community level, except that they display a relatively complex picture. As stated above, in aggregate these local permutations at the community level resulted in total regional and statewide take estimates for harbor seal and sea lion which were similar between 1992 and 1993.

Subsistence harvest surveys have been conducted by the Division of Subsistence for a series of years in selected communities of the North Pacific Rim and Kodiak Islands, as shown in Figs. 11-14. In studies prior to 1992, harvests of marine mammals were collected while documenting a full range of wild resources used by a community. No subsistence surveys prior to 1992 included animals which were struck and lost, so comparisons across years can be made of harvested animals only.

TABLE 16
SUBSISTENCE HARBOR SEAL TAKES BY ALASKA NATIVES
BY COMMUNITY, 1992 AND 1993

Community	1992 Harbor Seal Harvested	1992 Harbor seal Struck and Lost	1992 Total Harbor Seal Take	1993 Harbor Seal Harvested	1993 Harbor seal Struck and Lost	1993 Total Harbor Seal Take
SOUTHEAST						
Angeon	125.1	28.9	154.0	56.6	9.9	66.5
Craig	74.2	0.0	74.2	51.1	9.8	60.9
Haines	30.5	7.9	38.4	23.0	2.3	25.3
Hoonah	350.2	24.0	375.0	324.4	35.8	360.2
Hydaburg	30.0	2.1	32.1	14.0	0.0	14.0
Juneau	122.6	7.6	130.2	59.0	21.6	80.6
Kake	173.9	12.3	186.2	100.8	15.2	115.9
Kasaan	0.0	0.0	0.0			
Ketchikan	99.2	6.5	96.8	42.4	2.9	45.3
Klawock	39.0	7.4	40.3	39.8	0.0	39.8
Klukwan	8.0	2.0	10.0	1.2	0.0	1.2
Metlakatla	1.3	0.0	1.3			
Pelican	12.9	1.3	14.1	5.3	1.1	6.4
Petersburg	22.4	2.6	25.0	4.5	4.5	9.0
Saxman	22.2	1.2	23.5	5.6	0.0	5.6
Sitka	124.7	21.4	146.1	109.3	20.6	129.9
Wrangell	8.0	8.0	14.0	19.5	9.0	28.5
Yakutat	248.0	61.3	309.3	568.4	57.4	625.8
NORTH PACIFIC RIM						
Chenega Bay	42.6	2.3	44.9	60.8	2.2	63.0
Cordova	103.8	8.8	112.5	147.4	5.5	152.9
Narwhalek	27.9	0.0	27.9	29.5	3.3	32.7
Port Graham	36.2	4.7	40.8	31.6	3.2	34.8
Seldovia	12.4	0.0	12.4	7.9	4.9	12.8
Seward	2.0	0.0	2.0	0.0	0.0	0.0
Tatitlek	152.9	17.7	170.6	108.7	14.5	123.2
Valdez	0.0	0.0	0.0	21.0	4.0	25.0
UPPER KENAI-COOKINLET						
Anchorage	17.1	0.0	17.1	24.4	5.6	30.0
Homer				4.0	0.0	4.0
Kenai	33.3	0.0	33.3	20.0	0.0	20.0
Tyonek	1.1	0.0	1.1			
KODIAK ISLAND						
Akhiok	20.0	3.0	23.0	13.3	0.0	13.3
Karluk	16.5	1.5	18.0	10.0	1.3	11.3
Kodiak City	36.9	0.0	36.9	6.0	1.0	7.0
Larsen Bay	6.5	0.0	6.5	7.7	5.5	13.2
Old Harbor	86.8	7.8	94.7	67.6	2.7	70.3
Ouzinkie	21.6	1.1	23.0	41.2	8.7	49.8
Port Lions	36.9	2.2	39.1	26.0	1.0	27.0

TABLE 16 (CONTINUED)
SUBSISTENCE HARBOR **SEAL** TAKES BY ALASKA NATIVES
BY COMMUNITY, 1992 AND 1993

Community	1992 Harbor Seal Harvested	1992 Harbor Seal Struck and Lost	1992 Total Harbor Seal Take	1993 Harbor Seal Harvested	1993 Harbor Seal Struck and Lost	1993 Total Harbor Seal Take
SOUTH ALASKA PENINSULA						
Chignik Bay	2.4	1.2	3.6	6.3	5.0	11.3
Chignik Lagoon	4.0	0.0	4.0	4.3	1.1	5.3
Chignik Lake	8.3	2.1	10.3	15.2	5.5	20.8
False Pan	18.0	0.0	18.0	19.0	0.0	19.0
Ivanof Bay	10.0	1.0	11.0	16.3	4.7	21.0
King cove	26.0	6.7	32.7	12.8	3.5	16.3
Nelson Lagoon	0.0	0.0	0.0	*	*	*
Perryville	8.9	2.2	11.1	12.8	2.1	15.0
sand Point	37.9	0.0	37.9	13.3	1.2	14.4
ALEUTIAN ISLANDS						
Akutan	12.9	4.3	17.1	15.6	4.5	20.1
Atka	28.6	9.9	38.5	32.7	0.0	32.7
Nikolski	5.8	3.5	9.3	4.0	1.0	5.0
Unalaska	47.0	3.7	50.8	32.7	9.9	42.6
PRIBILOF ISLANDS						
Saint George	0.0	0.0	0.0	0.0	0.0	0.0
Saint Paul*	2.3	1.2	3.5	2.3	1.2	3.5
SOUTH BRISTOL BAY						
Egegik	3.3	14.3	17.7	7.7	3.3	11.0
King Salmon	10.2	0.0	10.2	21.3	10.7	32.0
Levelock	10.6	0.0	10.8	2.7	5.4	8.1
Naknek	26.6	7.0	33.6	2.7	0.0	2.7
Pilot Point	5.4	4.3	9.7	2.2	0.0	2.2
Port Heiden	40.5	22.5	83.0	30.7	19.9	50.6
South Naknek	2.3	6.9	9.2	6.4	18.0	24.4
NORTH BRISTOL BAY						
Abknagik	0.0	3.6	3.6	0.0	0.0	0.0
Clark's Point	0.0	0.0	0.0	0.0	0.0	0.0
Dillingham	29.2	3.8	32.9	18.0	4.2	22.2
Manokotak	4.9	3.8	8.7	3.2	0.0	3.2
Togiak	24.3	2.0	26.3	24.9	14.7	39.6

* Part Graham 1992 takes revised from earlier estimates; St. Paul 1992 takes are used to estimate 1993 takes.

TABLE 17
SUBSISTENCE SEA LION TAKES BY ALASKA NATIVES
BY **COMMUNITY**, 1992 AND 1993

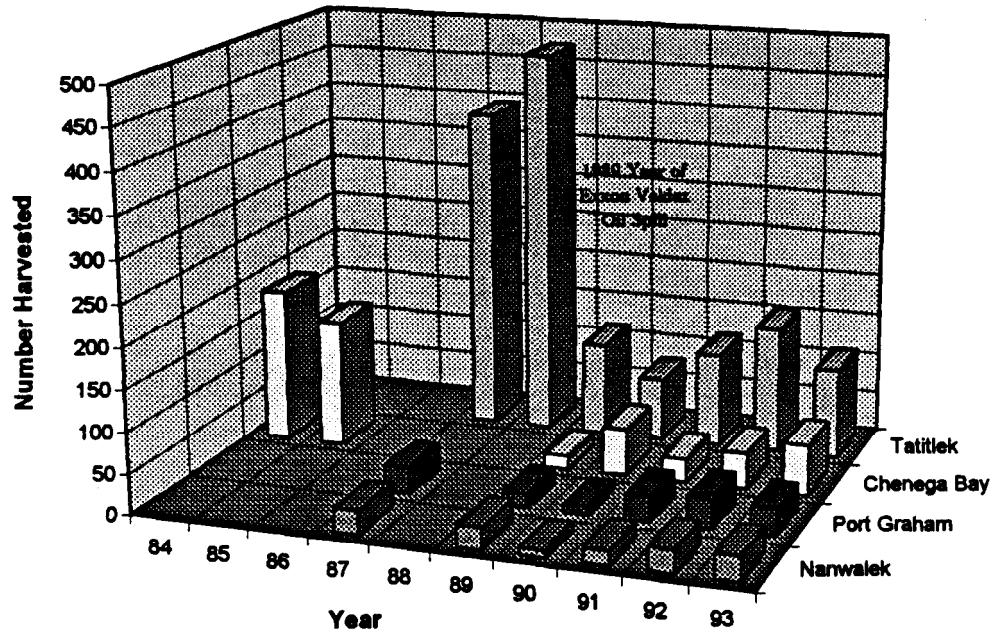
Region and Community	1992 Sea Lion Harvested	1992 Sea Lion Struck and Lost	1992 Total Sea Lion Take	1993 Sea Lion Harvested	1993 Sea Lion Struck and Lost	1993 Total Sea Lion Take
SOUTHEAST						
Anchorage	0.0	0.0	0.0	0.0	0.0	0.0
Craig	0.0	0.0	0.0	0.0	0.0	0.0
Haines	0.0	0.0	0.0	0.0	0.0	0.0
Hoonah	0.0	0.0	0.0	0.0	0.0	0.0
Hydaburg	0.0	0.0	0.0	0.0	0.0	0.0
Juneau	0.0	0.0	0.0	0.0	0.0	0.0
Kake	0.0	0.0	0.0	0.0	0.0	0.0
Kasaan	0.0	0.0	0.0	0.0	0.0	0.0
Ketchikan	0.0	0.0	0.0	0.0	0.0	0.0
Klawock	1.4	0.0	1.4	0.0	0.0	0.0
Klukwan	0.0	0.0	0.0	0.0	0.0	0.0
Metlakatla	0.0	0.0	0.0	0.0	0.0	0.0
Pelican	0.0	0.0	0.0	0.0	0.0	0.0
Petersburg	0.0	0.0	0.0	0.0	0.0	0.0
Saxman	0.0	0.0	0.0	0.0	0.0	0.0
Sitka	3.8	1.3	5.0	0.0	1.1	1.1
Wrangell	0.0	0.0	0.0	0.0	0.0	0.0
Yakutat	0.0	0.0	0.0	0.0	0.0	0.0
NORTH PACIFIC RIM						
Chenega Bay	6.9	1.2	8.1	11.1	6.6	17.7
Cordova	0.0	0.0	0.0	1.5	0.0	1.5
Nanwalek	6.3	0.0	6.3	8.7	1.1	9.8
Port Graham	3.5	1.2	4.7	1.1	0.0	1.1
Seldovia	0.0	0.0	0.0	0.0	0.0	0.0
Seward	0.0	0.0	0.0	0.0	0.0	0.0
Tatitlek	8.3	4.2	12.5	4.1	1.0	5.2
Valdez	0.0	0.0	0.0	0.0	0.0	0.0
UPPER KENAI-COOKINLET						
Anchorage	5.7	3.8	9.5	7.8	3.3	11.1
Homer	0.0	0.0	0.0	0.0	0.0	0.0
Kenai	0.0	0.0	0.0	0.0	0.0	0.0
Tyonek	0.0	0.0	0.0	0.0	0.0	0.0
KODIAK ISLAND						
Akhiok	3.0	1.0	4.0	0.0	0.0	0.0
Karluk	0.0	0.0	0.0	0.0	0.0	0.0
Kodiak City	0.0	0.0	0.0	0.0	12.7	12.7
Larsen Bay	1.1	0.0	1.1	0.0	0.0	0.0
Old Harbor	32.9	13.2	48.1	32.1	1.0	33.2
Ouzinkie	3.4	0.0	3.4	5.4	2.2	7.6
Port Lions	1.1	2.2	3.2	4.0	1.0	5.0

TABLE 17 (CONTINUED)
 SUBSISTENCE SEA LION TAKES BY **ALASKA** NATIVES
 BY COMMUNITY, 1992 AND 1993

Region and Community	1992 Sea Lion Harvested	1992 Sea Lion Struck and Lost	1992 Total Sea Lion Take	1993 Sea Lion Harvested	1993 Sea Lion Struck and Lost	1993 Total Sea Lion Take
SOUTH ALASKA PENINSULA						
Chignik Bay	0.0	0.0	0.0	0.0	0.0	0.0
Chignik Lagoon	0.0	0.0	0.0	1.1	0.0	1.1
Chignik Lake	0.0	0.0	0.0	0.0	0.0	0.0
False Pass	0.0	0.0	0.0	0.0	0.0	0.0
Ivanof Say	0.0	0.0	0.0	2.3	1.2	3.5
King cove	1.3	0.0	1.3	1.2	0.0	1.2
Nelson Lagoon	0.0	0.0	0.0	0.0	0.0	0.0
Perryville	1.1	0.0	1.1	0.0	0.0	0.0
Send Point	0.0	0.0	0.0	0.0	0.0	0.0
ALEUTIAN ISLANDS						
Akutan	25.7	4.3	30.0	14.5	8.9	23.4
Atka	28.6	9.9	38.5	25.1	0.0	25.1
Nikolski	8.2	0.0	8.2	6.0	0.0	6.0
Unalaska	41.8	16.7	58.5	53.4	15.9	89.3
PRIBILOF ISLANDS						
Saint George	14.9	55.0	69.9	3.7	14.8	18.6
Saint Paul*	161.7	65.2	226.8	161.7	65.2	226.8
SOUTH BRISTOL BAY						
Egegik	0.0	0.0	0.0	0.0	0.0	0.0
King Salmon	0.0	0.0	0.0	0.0	0.0	0.0
Levelock	0.0	0.0	0.0	0.0	0.0	0.0
Naknek	0.0	0.0	0.0	0.0	0.0	0.0
Pilot Point	0.0	0.0	0.0	0.0	0.0	0.0
Port Heiden	0.0	0.0	0.0	0.0	0.0	0.0
South Naknek	0.0	0.0	0.0	0.0	0.0	0.0
NORTH BRISTOL BAY						
Aleknagik	0.0	0.0	0.0	0.0	0.0	0.0
Clark's Point	0.0	0.0	0.0	0.0	0.0	0.0
Dillingham	0.0	0.0	0.0	0.0	0.0	0.0
Manokotak	3.9	0.0	3.9	0.0	0.0	0.0
Togiak	3.9	0.0	3.9	3.3	3.3	6.5

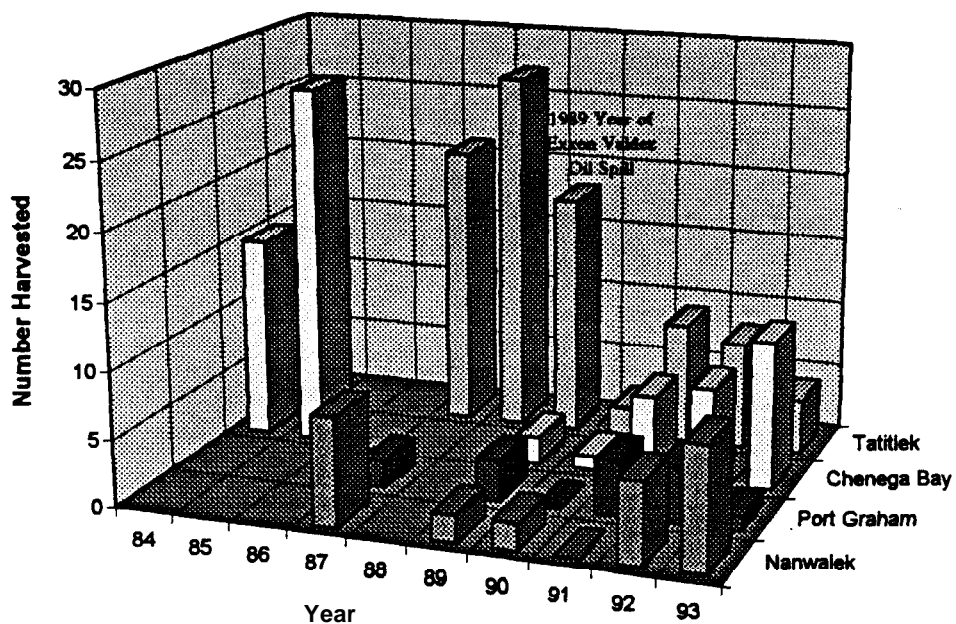
* Port Graham 1992 takes revised from earlier estimates; St. Paul 1992 takes are used to estimate 1993 takes.

Fig. 11.
Change in Harbor Seal Harvests,
North Pacific Rim Communities



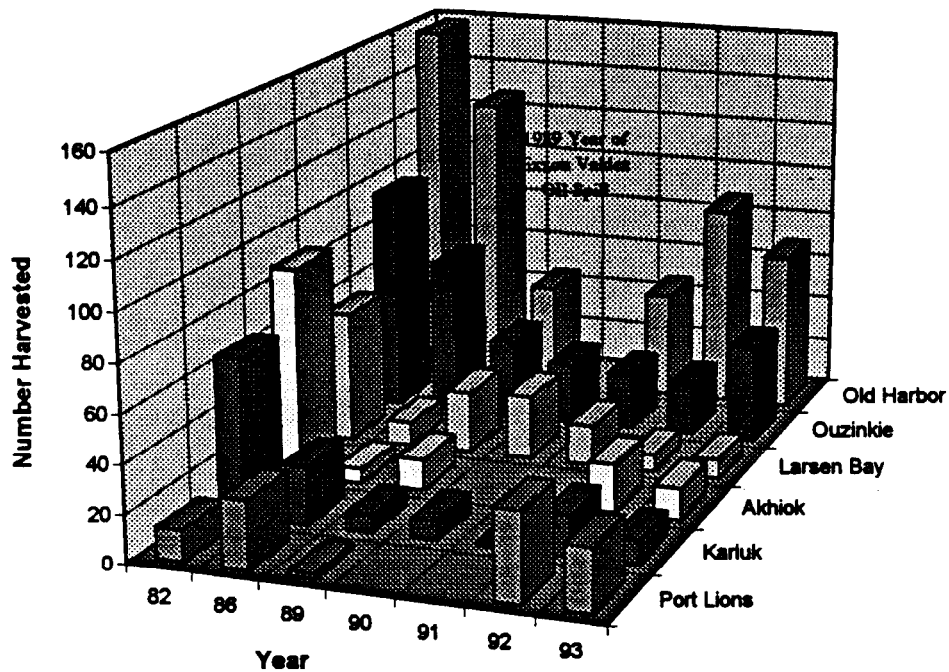
HARBOR SEAL HARVESTS				
Year	Nanwalek	Port Graham	Chenega Bay	Tatitlek
84			186	
85			154	
86				
87	29	32		393
88				473
89	27	17	16	113
90	9	10	57	76
91	18	30	28	114
92	28	36	43	153
93	30	32	61	109

Fig. 12.
Change in Sea lion Harvests,
North Pacific Rim Communities



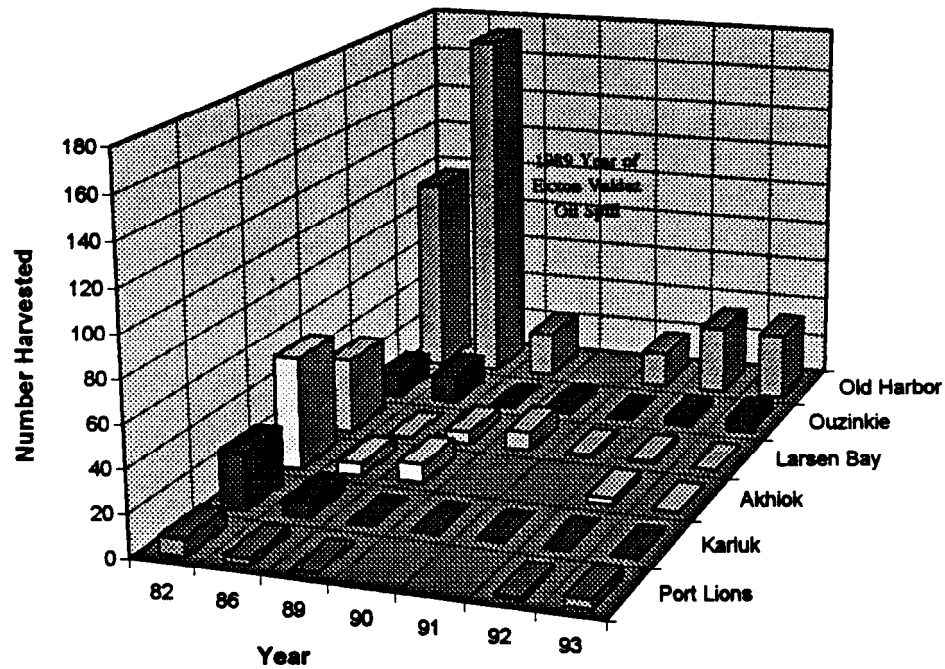
SEA LION HARVESTS				
Year	Nanwalek	Port Graham	Chenega Bay	Tatitlek
84			15	
85			27	
86				
87	8	2		21
88				27
89	2	3	2	18
90	2	0	1	2
91	0	4	6	9
92	6	4	7	8
93				

Fig. 13.
Changes in Harbor Seal Harvests,
Kodiak Island Communities



HARBOR SEAL HARVESTS						
<u>Year</u>	<u>Port Lions</u>	<u>Karluk</u>	<u>Akhiok</u>	<u>L a r s e n</u>	<u>Ouzinkie</u>	<u>Old Harbor</u>
82	13	66	69	56	96	156
66	26	24	6	10	67	127
69	2	7	13	26	34	45
90		8		27	26	
91		1		17	24	46
92	37	17	20	7	22	87
93	26	10	13	8	41	68

Fig. 14.
Changes in Sea Lion Harvests,
Kodiak Island Communities



SEA LION HARVESTS						
	<u>Port Lions</u>	<u>Karluk</u>	<u>Akhiok</u>	<u>Larsen Bay</u>	<u>Ouzinkie</u>	<u>Old Harbor</u>
82	8	27	54	36	11	96
86	3	7	6	0	13	173
89	0	0	9	6	0	22
90		0		9	3	
91		0		1	0	17
92	1	0	3	1	3	33
93	4	0	0	0	5	32

In the North Pacific Rim region, there appear to be relatively complex changes occurring in the harvests of four communities where there are five or more years of information (Figs. 11 and 12) In Tatitlek and Chenega Bay, estimated harbor seal and sea lion harvests were substantially larger prior to 1989, the year of the *Exxon Valdez* Oil Spill, than after (Figs. 11 and 12). While there is a suggestion of a possible trend toward increasing harvests since 1990, the increases are not continuous or clear cut, and recent harvests do not approach pre-spill levels. For Nanwalek and Port Graham, the lowest estimated harbor seal harvests were recorded for 1990, the year after the oil spill, while the estimated harvests of the last two years are similar to the one pre-spill estimate in 1987.

On Kodiak Island (Figs. 13 and 14), estimated harbor seal takes in 1993 were lower for five of six communities compared with estimates in 1982. For years with complete information for all six communities, harbor seal harvests were 478 (1982), 262 (1986), 127 (1989), 190 (1992), and 166 (1993). This suggests declining harvests on Kodiak Island. However, harvests display substantial variability at the community level between years. With sea lions, estimated harvests in 1993 were lower for all six Kodiak Island communities compared with estimates in 1982. Three communities (Karluk, Akhiok, and Larsen Bay) reported no sea lion harvests in 1993, whereas the same communities harvested 1 17 sea lions in 1982. Sea lion harvests for years with complete community coverage were 232 (1982), 202 (1986), 37 (1989), 41 (1992), and 41 (1993).

Assessment of the Local and Regional Research Network

This report has covered the second year of a two-year project to document the subsistence takes of harbor seal and sea lion by Alaska Natives. Unlike the first year, where most household surveys were conducted by teams of local and regional researchers, during the second year information on subsistence takes was collected

principally by locally-hired researchers in each community, who were part of a local and regional research network.

The effectiveness of this type of research structure was uncertain at its onset. It was anticipated that a variety of problems might arise in a certain number of communities. Accordingly, a network of local and regional researchers was designed in order to have a structure which might flexibly deal with emergent issues. Regional researchers in Anchorage, Dillingham, Juneau, and Kodiak City were available to provide additional survey support to local researchers when required.

By a number of standards, the network of local and regional researchers for collecting subsistence harvest information appears to have worked successfully in 1993. Subsistence information meeting project standards was received from 59 of 60 communities. This is a high success rate considering the number and geographic dispersion of communities covered by the project. The number of surveyed households and household response rates also were high. In 1993, 2,087 households were surveyed, compared with 2,105 households in 1992. For communities with census or chain referral samples, 86 percent of households were successfully contacted and interviewed, and for high strata in two-strata samples, 90 percent of households were successfully contacted and interviewed. This indicates that local researchers working alone in 1993 were as effective in locating and surveying hunters as teams of local and regional researchers working together in 1992.

As described above, there are overall similarities between the 1992 and 1993 data sets at the regional and state levels in terms of harvest levels, struck and lost rates, age and sex distributions of harvests, and seasonal cycles of take. Assuming these parameters of the subsistence take do not vary markedly from one year to the next at the state and regional levels, the comparison of the two

sequential years can be taken as a form of test-retest reliability of the entire data set. All suggest that local researchers collected information of comparable reliability to the first year's information. The similarities of the 1992 and 1993 data along these several parameters suggest that no obvious data anomalies were introduced by changing to a network of local and regional researchers the second study year.

While the local and regional network system appeared to have been successful overall, as anticipated there were certain problems which had to be addressed during survey rounds. In several communities, surveys were received late, after announced deadlines. In some cases, this was due to local researchers having to postpone interviews until some households returned to the community from commercial fishing, holiday travels, or other activities. In the future, postponing the survey round by a month, from December to January, may decrease the number of delays associated with Christmas holiday activities. In other cases, local researchers simply took longer to complete surveys than scheduled. Telephone contacts between regional and local researchers eventually were successful in most cases to expedite the completion and mailing of surveys by local researchers. Late surveys set back data processing and report writing schedules, which had to be delayed until all survey data were entered.

As anticipated, there was considerable turnover in local researchers during the project. In some communities, local researchers completed one survey round, but declined work for the second survey round. In Some cases, local researchers quit, became incommunicado, or were terminated before a complete set of household surveys had been received from a survey round. To fill positions, regional researchers recruited, hired, and trained other local researchers, who completed unfinished household surveys or conducted the second survey round. Assessing the degree of turnover, 35 local researchers worked both survey rounds,

26 local researchers worked the first survey round only, and 19 local researchers worked the second survey round only. It is uncertain whether this degree of turnover in employees will continue, or whether a more stable work network eventually will emerge over several survey iterations.

In some cases, completed survey forms received for data processing contained ambiguous or incomplete information. The system of maintaining survey tracking sheets to identify households whose surveys were incomplete, and of maintaining record sheets in triplicate, was used to resolve these types of questions. Regional and local researchers reviewed forms by phone, sometimes contacting the surveyed household a second time, to augment or clarify information entered on survey forms when necessary. Some details of data collection did not work as planned. In particular, information missed during the first survey round from certain households, usually was not asked about by local researchers during the second survey round.

Overall, the findings of the project's second year indicate that subsistence takes of marine mammals can be successfully documented with a research methodology that utilizes local researchers in major research roles. We believe the long-term success of subsistence monitoring of harbor seal and sea lion is dependent upon appropriate organizational structures that directly incorporates marine mammal hunters into the program, as was attempted the second year. We also believe that it would be advantageous for there to be statewide Alaska Native organizations dealing specifically with harbor seal and sea lion. Such organizations might help in collaborative research efforts, and serve to represent the subsistence users of these two species, as currently exists with beluga, walrus, bowhead whale, and sea otter. Appropriate organizational structures incorporating subsistence users of sea lions and harbor seals probably would improve the long-term success of subsistence research programs.

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APPENDIX A

**SURVEY INSTRUMENT USED
IN HOUSEHOLD INTERVIEWS, 1993**

The Subsistence Harvest of Harbor Seal and Sea Lion by Alaska Natives in 1993, by Robert J. Wolfe and Craig Mishler, Division of Subsistence, Alaska Department of Fish and Game, Juneau, Alaska, July 1993. Final Report for Year Two, Subsistence Study and Monitor System (No. 50ABNF200055), Prepared for the National Marine Fisheries Service.

ARE ANY MEMBERS OF YOUR HOUSEHOLD ALASKA NATIVES?

YES: _____

NO: _____ THANK YOU FOR YOUR COOPERATION.

This survey is only relevant to Native households

How many people lived in your household in 1993? _____

FOR ANCHORAGE ONLY: Where did you hunt? _____

HARBOR SEAL

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE HARBOR SEALS IN 1993?

____ YES, PLEASE COMPLETE THE FOLLOWING QUESTIONS:

During 1993, did your household:

Yes No

1. Use harbor seals (meat, hides, or oil)?
2. Attempt to harvest (hunt) harbor seals?
3. Harvest (kill) harbor seals?
4. Receive harbor seals from other households or communities?
5. Give away harbor seals to other households or communities?

____ NO, COMPLETE SEA LION SURVEY.

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, TURN OVER AND COMPLETE SEA LION SURVEY.

6. How many harbor seals did your household kill? [Enter in total box.]

7. In which months did you kill them? How many in (January, etc.)? [Enter the numbers by month.]

HARBOR SEAL	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
TOTAL														

8. Of the harbor seal you killed in (January, etc.), how many were male or female, and how many were pups, juveniles (young, pre-adults), or adults? [Enter the numbers by month.]

HARBOR SEAL (Detail)	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
ADULT	MALE													
	FEMALE													
	UNKNOWN													
JUVENILE	MALE													
	FEMALE													
	UNKNOWN													
PUP	MALE													
	FEMALE													
	UNKNOWN													
UNKNOWN	MALE													
	FEMALE													
	UNKNOWN													

During 1993,

9. How many harbor seal were struck and lost by your household? [Enter number in total box]

10. In which months were they struck and lost? [Enter numbers by month.]

HARBOR SEAL	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
STRUCK AND LOST														

Community: _____

() HHID: _____

LIST: Hunter Random

Interviewer: _____

Date: _____

SEA LIONS.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE SEA LIONS IN 1993?

IF YES, PLEASE COMPLETE THE FOLLOWING QUESTIONS:

IF NO, Thank you for your cooperation.

During 1993, did your household:

Yes	No

1. Use sea lions (meat, hides, or oil)?
2. Attempt to harvest (hunt) sea lions?
3. Harvest (kill) sea lions?
4. Receive sea lions from other households or communities?
5. Give away sea lions to other households or communities?

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, THIS COMPLETES THE SURVEY. THANK YOU FOR YOUR COOPERATION.

6. How many sea lions did your household kill? [Enter in total box.]

7. In which months did you kill them? How many in (January, etc.)? [Enter the numbers by month.]

SEA LIONS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL

8. Of the sea lions you killed in (January, etc.), how many were male or female, and how many were pups, juveniles (young, pre-adults), or adults?

[Enter the numbers by month.]

SEA LIONS (Detail)	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN														
MALE														
FEMALE														
UNKNOWN														
AGE														
MALE														
FEMALE														
UNKNOWN														

During 1993,

9. How many sea lions were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

SEA LIONS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
STUCK AND LOST														

THANK YOU FOR YOUR COOPERATION.

Community: _____

() HHID: _____

LIST: Hunter Random

Interviewer: _____

Date: _____

ARE ANY MEMBERS OF YOUR HOUSEHOLD ALASKA NATIVES?

YES: _____

NO: _____

THANK YOU FOR YOUR COOPERATION.
This survey is only relevant to Native households.

How many people lived in your household in 1994? _____

FOR ANCHORAGE ONLY: Where did you hunt? _____

HARBOR SEAL

DID MEMBERS OF YOUR HOUSEHOLD HUNT OR USE HARBOR SEALS IN DECEMBER 1993 OR 1994?

YES _____

NO _____

(IF YES, PLEASE COMPLETE THE FOLLOWING QUESTIONS:)

(IF NO, GO TO SEA LION PAGE.)

During December 1993 or 1994, did your household:

Yes No

- | | | |
|---|--|--|
| 1. Use harbor seals (meat, hides, or oil)? | | |
| 2. Attempt to harvest (hunt) harbor seals? | | |
| 3. Harvest (kill) harbor seals? | | |
| 4. Receive harbor seals from other households or communities? | | |
| 5. Give away harbor seals to other households or communities? | | |

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, TURN OVER AND COMPLETE SEA LION SURVEY.

6. How many harbor seals did your household kill? [Enter in total box.]

7. In which months did you kill them? How many in (January, etc.)? [Enter the numbers by month.]

HARBOR SEAL	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	UNKNOWN	TOTAL
TOTAL														

8. Of the harbor seal you killed in (January, etc.), how many were male or female, and how many were pups, juveniles (young, pre-adults), or adults? [Enter the numbers by month.]

HARBOR SEAL (Detail)	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	UNKNOWN	TOTAL
ADULT	MALE													
	FEMALE													
	UNKNOWN													
JUVENILE	MALE													
	FEMALE													
	UNKNOWN													
PUP	MALE													
	FEMALE													
	UNKNOWN													
UNKNOWN	MALE													
AGE	FEMALE													
	UNKNOWN													

During December 1993 or 1994,

9. How many harbor seal were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

HARBOR SEAL	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	UNKNOWN	TOTAL
STUCK AND LOST														

Community: _____

HHID: _____

LIST: Hunter Random

Interviewer: _____

Date: _____

SEA LIONS

DID MEMBERS OF YOUR HOUSEHOLD HUNT OR USE SEA LIONS IN DECEMBER 1993 OR 1994?

YES

NO

(IF YES, PLEASE COMPLETE THE FOLLOWING QUESTIONS:)

(IF NO, THAT COMPLETES THIS SURVEY. THANK YOU.)

During DEC. 1993 OR 1994, did your household:

	Yes	No
1. Use sea lions (meat, hides, or oil)?		
2. Attempt to harvest (hunt) sea lions?		
3. Harvest (kill) sea lions?		
4. Receive sea lions from other households or communities?		
5. Give away sea lions to other households or communities?		

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, THIS COMPLETES THE SURVEY. THANK YOU FOR YOUR COOPERATION.

6. How many sea lions did your household kill? [Enter in total box.]

7. In which months did you kill them? How many in (January, etc.)? [Enter the numbers by month.]

V

SEA LIONS	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	UNKNOWN	TOTAL
TOTAL														

8. Of the sea lions you killed in (January, etc.), how many were male or female, and how many were pups, juveniles (young, pre-adults), or adults?

[Enter the numbers by month.]

SEA LIONS (Detail)	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN														
MALE														
FEMALE														
UNKNOWN														

During December 1993 or 1994,

9. How many sea lions were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

V

SEA LIONS	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	UNKNOWN	TOTAL
STRUCK AND LOST														

THANK YOU FOR YOUR COOPERATION.

Community: _____

() HHID: _____

LIST: Hunter Random

Interviewer: _____

Date: _____

**APPENDIX B
SUBSISTENCE TAKES OF
HARBOR SEAL AND SEA LION
BY REGION**

Harbor Seal (*Phoca vitulina*)

PAGE	REGION
1-2	Southeast Alaska
3-4	North Pacific Rim
5-6	Upper Kenai-Cook Inlet
7-8	Kodiak Island
9-10	South Alaska Peninsula
11-12	Aleutian Islands
13-14	Pribilof Islands
15-16	South Bristol Bay
17-18	North Bristol Bay

Harbor and Spotted Seal

PAGE	REGION
19-20	North Bristol Bay

Spotted Seal (*Phoca largha*)

PAGE	REGION
21-22	North Bristol Bay

Sea Lion (*Eumetopias jubatus*)

PAGE	REGION
23-24	Southeast Alaska
25-26	North Pacific Rim
27-28	Upper Kenai-Cook Inlet
29-30	Kodiak Island
31-32	South Alaska Peninsula
33-34	Aleutian Islands
35-36	Pribilof Islands
37-38	South Bristol Bay
39-40	North Bristol Bay

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TAKE ESTIMATES: SOUTHEAST ALASKA, 1993

SAMPLING DESIGN: Mixed Chain Referral

	Active	Other	Total
Total Native Households	524	857	1381
Surveyed Households	458	258	716
Sampling Fraction	87.4%	30.1%	51.8%
Sample Household Members	1714	869	2583
Estimated Household Members	1940.6	3028.5	4969.1

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	N.A.
Hunted	N.A.
Harvested	N.A.
Received	N.A.
Gave Away	N.A.

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	1,425.1
Total Number Struck and Lost	190.0
Total Number Taken	1,615.1
Number Harvested Per Capita	N. A.

HARBOR SEAL HARVEST BY SEASON													Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	TOW
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	87	105	129	115	83	38	51	82	93	119	132	129	96	1239
Struck and Lost	1	3	12	8	2	12	10	Q	18	24	7	8	38	150
Total Take	88	108	141	123	85	50	81	91	111	143	139	135	134	1389
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	Q7.7	123.4	153.9	131.4	69.2	41.8	59.9	102.7	108.7	132.8	147.1	148.7	111.0	1425.1
Struck and Lost	1.1	3.3	15.1	13.3	2.2	13.5	13.3	25.5	21.0	26.4	7.8	8.5	41.3	190.0
Total Take	98.8	126.6	168.9	144.7	71.4	58.2	73.2	128.2	128.7	159.1	154.8	155.1	152.4	1818.1
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	108.8	133.7	165.8	147.1	78.2	47.4	se.5	111.2	118.0	136.8	156.6	159.0		1425.1
Struck and Lost	1.4	4.2	19.8	18.2	2.9	18.2	17.8	27.0	28.7	34.9	10.3	9.9		190.0
Total Take	100.2	137.8	185.6	163.3	81.2	63.6	83.9	139.1	144.7	171.7	166.9	168.9		1815.1
Total Take (%)	8.7%	8.8%	11.5%	10.1%	8.0%	3.9%	8.2%	8.8%	0.0%	10.8%	10.3%	10.5%		100%
Cumulative Take	108.2	246.0	431.8	596.0	878.1	730.7	823.7	Q82.8	1107.5	1279.1	1448.1	1815.0		
Cum. Take (%)	8.7%	15.2%	28.7%	36.6%	41.9%	48.8%	51.0%	59.6%	88.8%	79.2%	89.5%	100.0%		

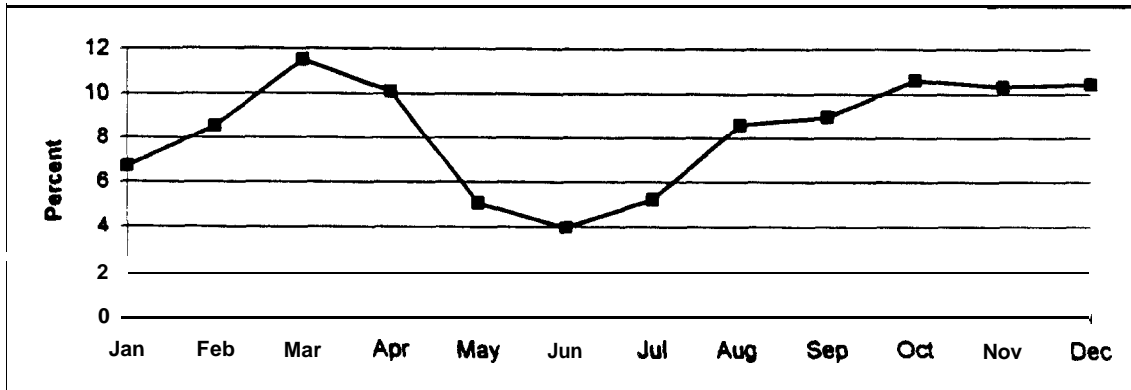
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	556	44.9%	842.2	45.1%
Adult Female	248	19.9%	296.0	20.8%
Adult Unknown Sex	215	17.4%	240.4	16.9%
Juvenile Male	31	2.5%	35.4	2.8%
Juvenile Female	11	0.9%	12.3	0.9%
Juvenile Unknown Sex	31	2.8%	34.1	2.4%
Pup Male	1	0.1%	1.1	0.1%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	12	1.0%	13.3	0.9%
Male Unknown Age	4	0.3%	4.4	0.3%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	132	10.7%	145.9	10.2%
Total	1239	100.0%	1428.1	100.0%

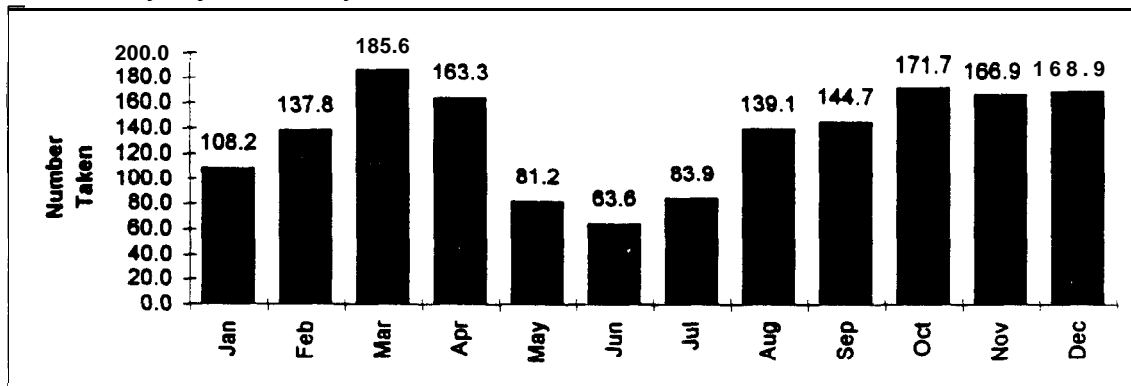
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: SOUTHEAST ALASKA, 1993

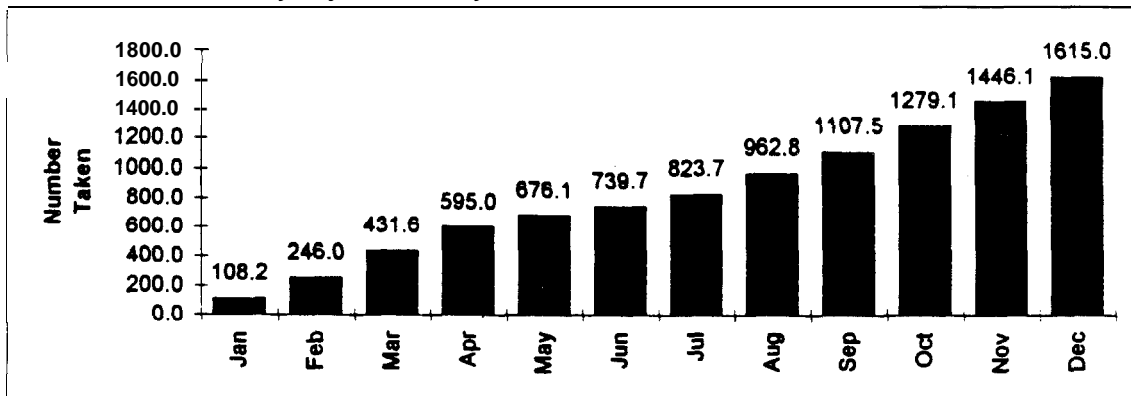
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TAKE ESTIMATES: NORTH PACIFIC RIM, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	35	507	542
Surveyed Households	29	198	227
Sampling Fraction	32.9%	39.1%	41.9%
Sample Household Memben	102	605	707
Estimated Household Members	121.1	1337.3	1438.4

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	N.A.
Hunted	N.A.
Harvested	N.A.
Received	N.A.
Gave Away	N.A.

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	406.3
Total Number Struck and Lost	37.6
Total Number Taken	444.3
Number Harvested Per Capita	0.27

HARBOR SEAL HARVEST BY SEASON														Unknown	Total
	Jan	Fob	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	15	8	16	15	12	11	13	19	32	60	68	64	17	350	
Struck and Lost	0	0	4	1	3	0	2	1	2	4	4	0	13	34	
Total Take	15	8	20	16	15	11	15	20	34	64	72	64	30	384	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	15.8	0.4	16.6	15.6	13.1	11.9	16.6	20.7	41.0	78.2	81.1	71.0	17.6	406.8	
Struck and Lost	0.0	0.0	4.1	1.1	3.3	0.0	3.9	1.1	2.1	4.0	4.5	0.0	13.5	37.6	
Total Take	15.8	8.4	20.8	16.6	16.3	11.9	19.8	21.6	43.1	82.2	85.6	71.0	31.1	444.3	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	16.2	8.8	20.0	15.6	13.8	12.6	16.6	21.9	41.8	0.2	84.6	74.8		406.0	
Struck and Lost	0.2	0.2	11.1	1.2	3.5	0.2	4.1	1.2	2.2	6.2	6.6	0.2		37.6	
Total Take	16.3	9.0	31.8	16.9	17.3	12.8	20.7	23.1	44.0	a. 4	91.2	75.0		444.3	
Total Take (%)	3.7%	2.0%	7.2%	3.8%	3.9%	2.9%	4.7%	5.2%	9.9%	19.4%	20.5%	16.9%		100%	
Cumulative Take	16.3	26.3	57.1	74.0	91.3	104.1	124.7	147.9	191.9	270.2	369.4	444.4			
Cum. Take (%)	3.7%	5.7%	12.9%	16.7%	20.5%	23.4%	26.1%	33.3%	43.2%	62.6%	83.1%	100.0%			

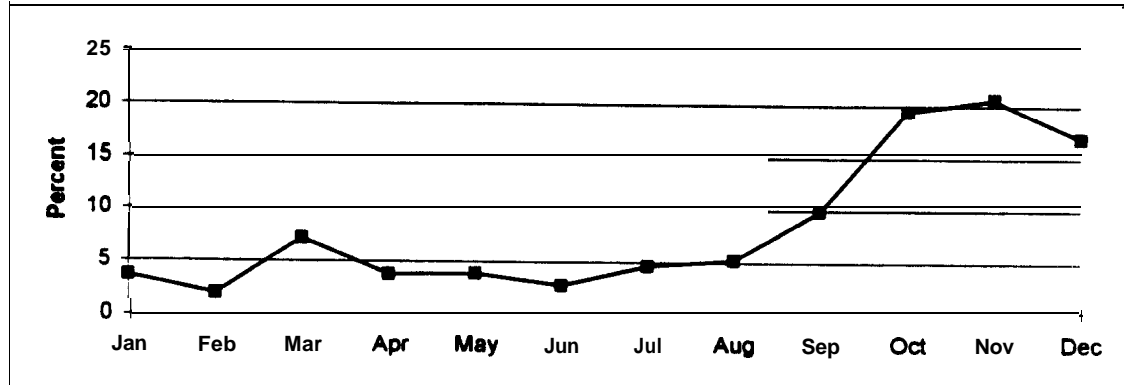
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	118	33.7%	145.0	35.6%
Adult Female	51	14.6%	60.3	14.8%
Adult Unknown Sex	70	20.0%	73.6	16.1%
Juvenile Male	26	7.4%	36.2	8.9%
Juvenile Female	9	2.6%	9.7	2.4%
Juvenile Unknown Sex	25	7.1%	27.0	6.6%
Pup Male	1	0.3%	1.1	0.3%
Pup Female	1	0.3%	1.1	0.3%
Pup Unknown Sex	2	0.6%	2.2	0.5%
Mate Unknown Age	7	2.41	7.1	1.7%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	40	11.4%	43.6	10.7%
Total	350	100.0%	406.8	100.0%

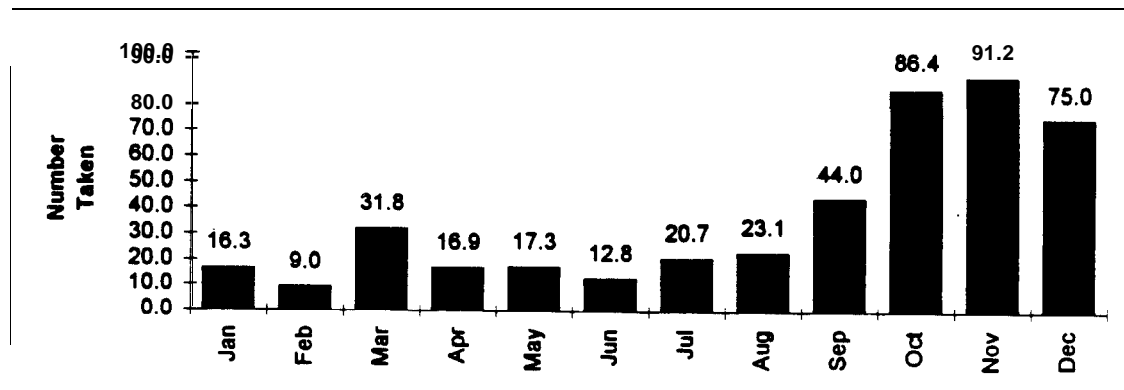
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: NORTH PACIFIC RIM, 1993

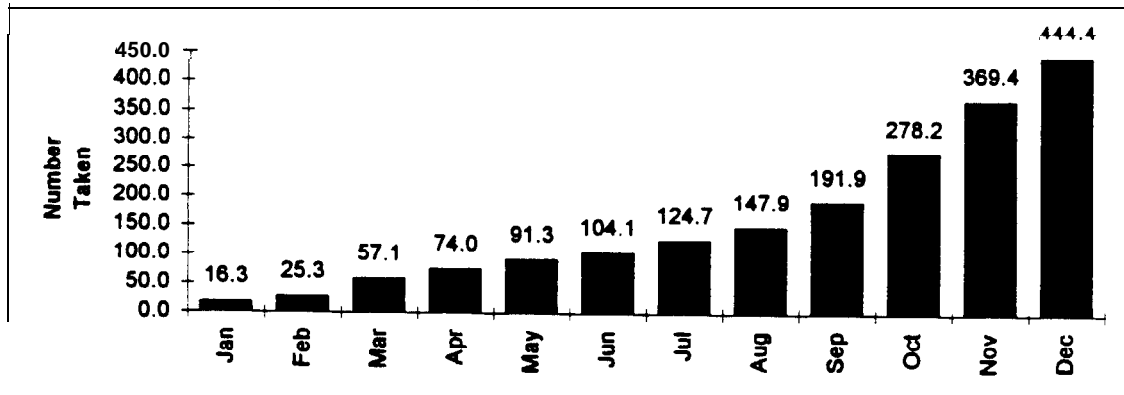
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TAKE ESTIMATES: UPPER KENAI - COOK INLET. 1993

SAMPLING DESIGN: MIXED

Total Native Households 54
 Surveyed Households 43
 Sampling Fraction 79.6%
 Sample Household Members 151
 Estimated Household Members 161.3

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used N.A.
 Hunted N.A.
 Harvested N.A.
 Received N.A.
 Gave Away N.A.

Estimated Community Harvest and Take (Expanded):

Total Number Harvested 49.2
 Total Number Struck and Lost 5.6
 Total Number Taken 54.8
 Number Harvested Per Capita 0.27

HARBOR SEAL HARVEST BY SEASON														Unknown	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	1	6	10	6	2	1	2	4	1	11	0	0	0	44	
Struck and Lost	1	0	1	0	0	0	0	0	0	0	0	0	3	5	
Total Take	2	6	11	6	2	1	2	4	1	11	0	0	3	49	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	1.1	7.4	11.8	6.7	2.2	1.1	2.2	4.4	1.1	11.1	0.0	0.0	0.0	49.2	
Struck and Lost	1.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	5.6	
Total Take	2.2	7.4	13.0	6.7	2.2	1.1	2.2	4.4	1.1	11.1	0.0	0.0	3.3	54.8	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	1.1	7.4	11.8	6.7	2.2	1.1	2.2	4.4	1.1	11.1	0.0	0.0		49.2	
Struck and Lost	2.6	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		5.6	
Total Take	3.9	7.4	14.6	6.7	2.2	1.1	2.2	4.4	1.1	11.1	0.0	0.0		54.8	
Total Take (%)	7.1%	13.5%	26.7%	12.2%	4.1%	2.0%	4.1%	6.1%	2.0%	20.3%	0.0%	0.0%		100%	
Cumulative Take	3.9	11.3	25.9	32.6	34.8	35.9	36.1	42.6	43.7	54.8	54.8	54.8			
Cum. Take (%)	7.1%	20.6%	47.3%	59.4%	63.5%	65.5%	8.6%	77.7%	79.7%	100.0%	100.0%	100.0%			

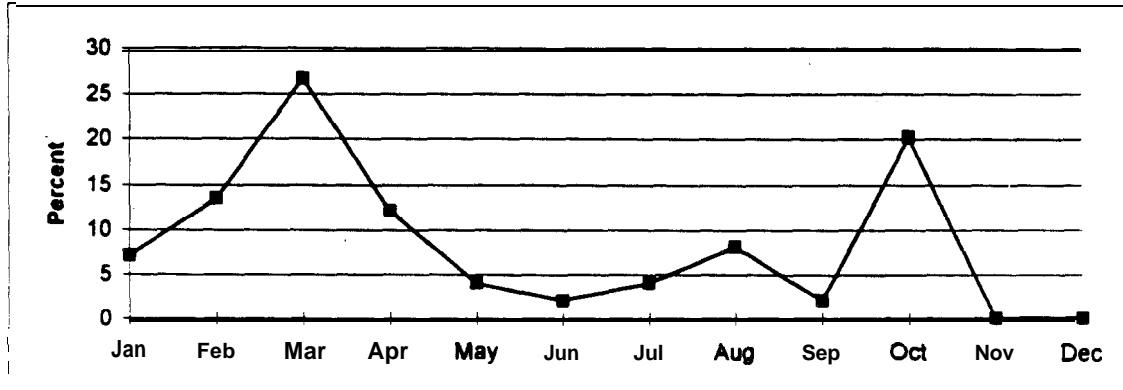
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	5	11.4%	5.6	11.3%
Adult Female	1	2.3%	2.4	4.9%
Adult Unknown Sex	23	52.3%	23.3	47.4%
Juvenile Male	1	2.3%	1.1	2.3%
Juvenile Female	1	2.3%	1.1	2.3%
Juvenile Unknown Sex	0	0.0%	0.0	0.0%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	13	29.5%	15.7	31.9%
Total	44	100.0%	49.2	100.0%

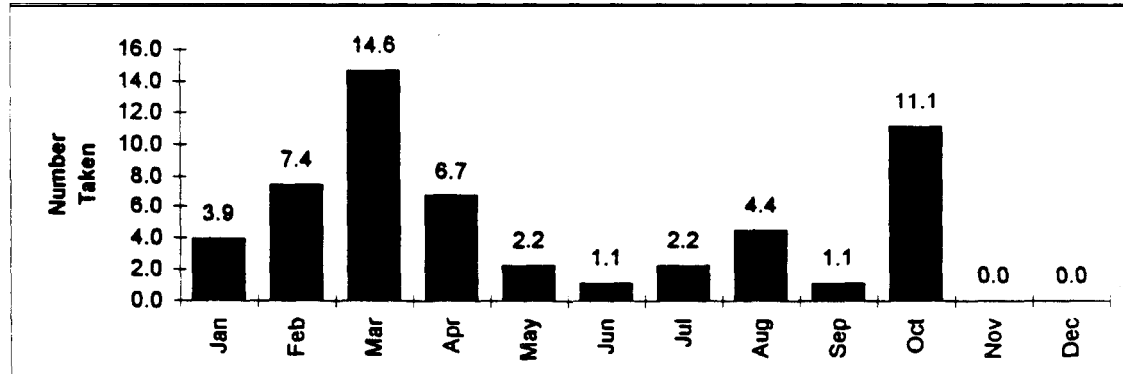
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: UPPER KENAI • COOK INLET, 1993

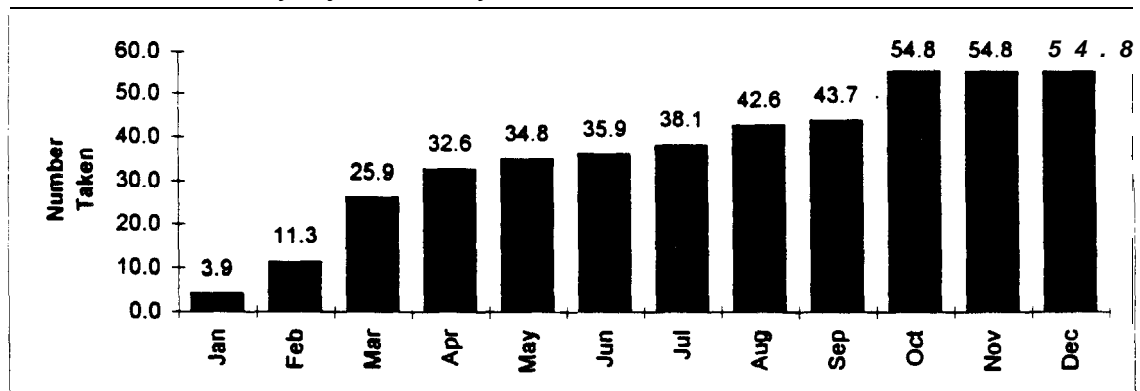
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TAKE ESTIMATES: KODIAK ISLAND, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	45	842	887
Surveyed Households	U	219	263
Sampling Fraction	97.8%	34.1%	38.3%
Sample Household Members	178	888	866
Estimated Household Members	182.1	1902.5	2084.8

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used 38.7%
Hunted 13.3%
Harvested 11.3%
Received 34.7%
Gave Away 15.2%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested 171.7
Total Number Struck and Lost 20.1
Total Number Taken 191.8
Number Harvested Per Capita 0.08

HARBOR SEAL HARVEST BY SEASON													Unknown		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total	
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	8	8	11	6	4	3	5	17	17	35	20	12	9	155	
Struck and Lost	0	0	0	1	0	0	0	4	2	2	0	2	7	18	
Total Take	8	8	11	7	4	3	5	21	19	37	20	14	16	173	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	8.8	10.1	12.0	6.2	4.1	3.1	5.8	17.6	19.1	39.7	22.6	12.7	9.8	171.7	
Struck and Lost	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	0.0	1.0	0.0	0.0	0.0	4.3	2.3	2.8	0.0	2.1	7.6	20.1
Total Take	8.8	10.1	12.0	7.2	4.1	3.1	5.8	22.2	21.3	42.5	22.8	14.8	17.4	191.8	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	9.5	10.4	12.8	8.2	4.1	3.1	8.1	19.8	20.4	42.1	23.3	14.0		171.7	
Struck and Lost	0.0	0.0	0.0	1.0	0.0	0.0	0.0	8.7	2.3	4.4	0.0	3.8		20.1	
Total Take	9.5	10.4	12.8	7.2	4.1	3.1	6.1	28.5	22.7	46.5	23.3	17.8		191.8	
Total Take (%)	4.9%	5.4%	6.6%	3.7%	2.2%	1.6%	3.2%	14.9%	11.8%	24.2%	12.1%	9.3%		100%	
Cumulative Take	9.5	19.9	32.6	39.7	43.9	47.0	53.1	81.6	104.3	150.8	174.0	191.8			
Cum. Take (%)	4.9%	10.4%	17.0%	20.7%	22.9%	24.5%	27.7%	42.6%	54.4%	78.8%	90.7%	100.0%			

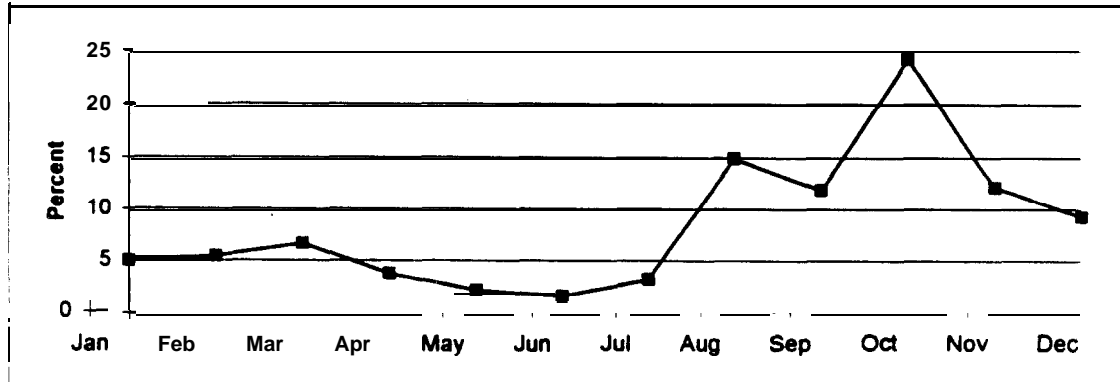
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated 8y Community (Expanded)	Percent
Adult Male	49	31.6%	54.4	31.7%
Adult Female	12	7.7%	12.7	7.4%
Adult Unknown Sex	23	14.8%	25.1	14.6%
Juvenile Male	38	24.5%	41.7	24.3%
Juvenile Female	8	5.2%	8.9	5.2%
Juvenile Unknown Sex	11	7.1%	11.6	6.8%
Pup Male	1	0.6%	1.1	0.6%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	1	0.6%	1.0	0.6%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	4	2.8%	6.6	3.9%
Unknown Sex and Age	8	5.2%	8.7	5.0%
Total	155	100.0%	171.7	100.0%

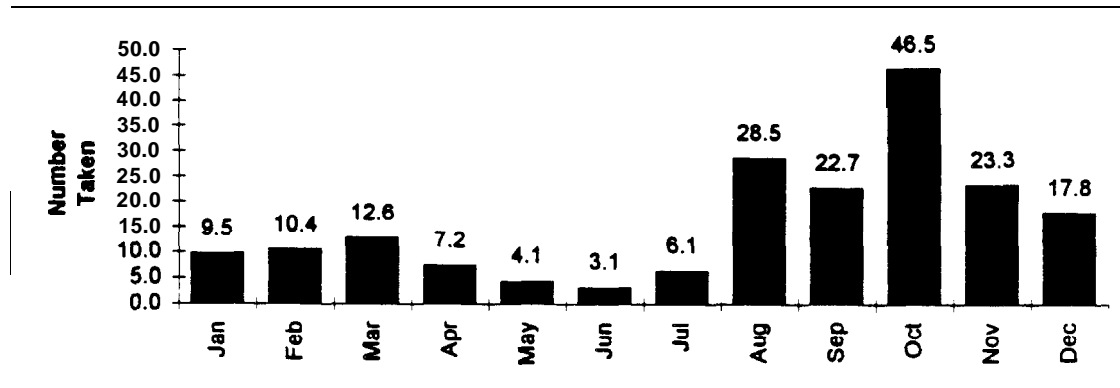
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: KODIAK ISLAND. 1993

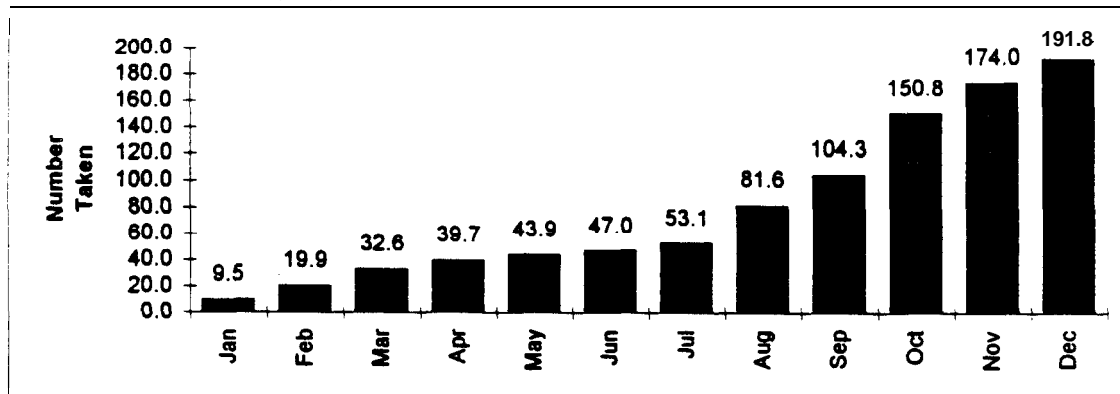
A Percentage **Seasonally Adjusted** Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (Phoca vitulina) HARVEST AND TAKE ESTIMATES: SOUTH ALASKA PENINSULA, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	28	367	395
Surveyed Households	24	172	198
Sampling Fraction	85.7%	48.9%	49.8%
Sample Household Members	95	599	894
Estimated Household Members	110.8	1242.3	1353.2

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	27.4%
Hunted	18.3%
Harvested	13.3%
Received	20.7%
Gave Away	17.1%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	100.0
Total Number Struck and Lost	23.1
Total Number Taken	123.1
Number Harvested Per Capita	0.07

HARBOR SEAL HARVEST BY SEASON														Unknown		Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month			
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)																
Harvest	4	8	6	4	2	4	5	9	15	11	6	7	1	62		
Struck and Lost	0	0	1	0	0	0	0	4	3	4	0	2	5	19		
Total Take	4	6	7	4	2	4	5	13	16	15	6	9	6	101		
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)																
Harvest	4.2	8.7	8.4	4.6	2.2	4.7	8.5	11.0	20.3	12.8	7.2	8.5	1.1	100.0		
Struck and Lost	0.0	0.0	1.2	0.0	0.0	0.0	0.0	5.1	3.7	4.9	0.0	2.1	6.1	23.1		
Total Take	4.2	8.7	7.6	4.6	2.2	4.7	8.5	16.1	24.0	17.6	7.2	10.7	7.1	123.1		
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)																
Harvest	4.4	9.2	8.5	4.8	2.2	4.7	8.6	11.0	20.6	12.9	7.2	6.6		100.0		
Struck and Lost	0.5	0.5	1.7	0.5	0.6	0.5	0.6	5.6	4.2	5.4	0.5	2.6		23.1		
Total Take	4.9	9.7	8.2	5.1	2.7	5.2	9.0	16.6	24.7	18.2	7.7	11.2		123.1		
Total Take (%)	4.0%	7.9%	6.6%	4.1%	2.2%	4.2%	7.3%	13.6%	20.1%	14.8%	6.2%	9.1%		100%		
Cumulative Take	4.9	14.6	22.7	27.8	30.5	35.7	44.7	61.3	86.0	104.3	111.9	123.1				
Cum Take (%)	4.6%	11.8%	18.5%	22.8%	24.8%	29.0%	36.3%	49.8%	69.9%	84.7%	90.9%	100.0%				

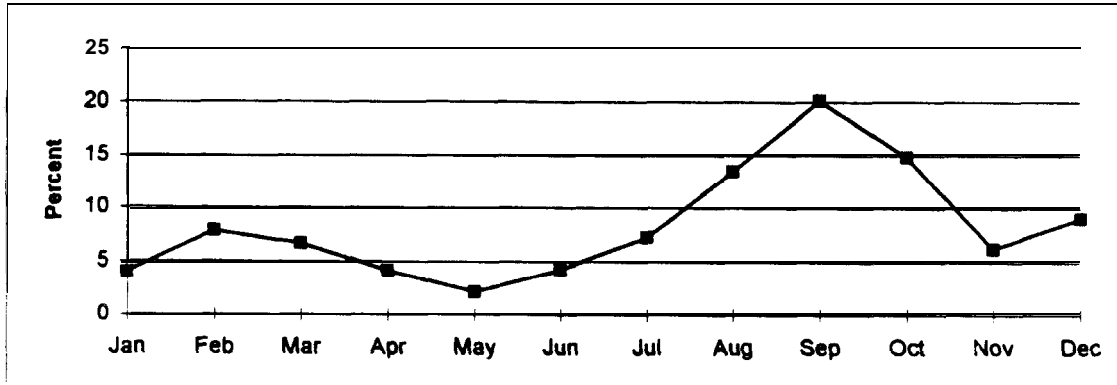
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	23	26.0%	27.4	27.4%
Adult Female	2	2.4%	2.2	2.2%
Adult Unknown Sex	29	35.4%	35.0	35.0%
Juvenile Male	4	4.9%	4.8	4.8%
Juvenile Female	2	2.4%	2.3	2.3%
Juvenile Unknown Sex	13	15.9%	15.2	16.2%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	4	4.9%	4.3	4.3%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	5	6.1%	8.7	8.7%
Total	82	100.0%	100.0	100.0%

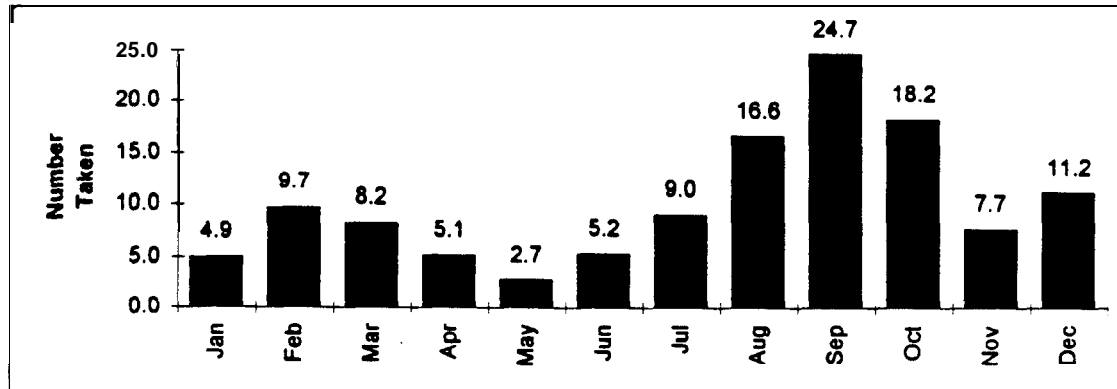
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: SOUTH ALASKA PENINSULA. 1993

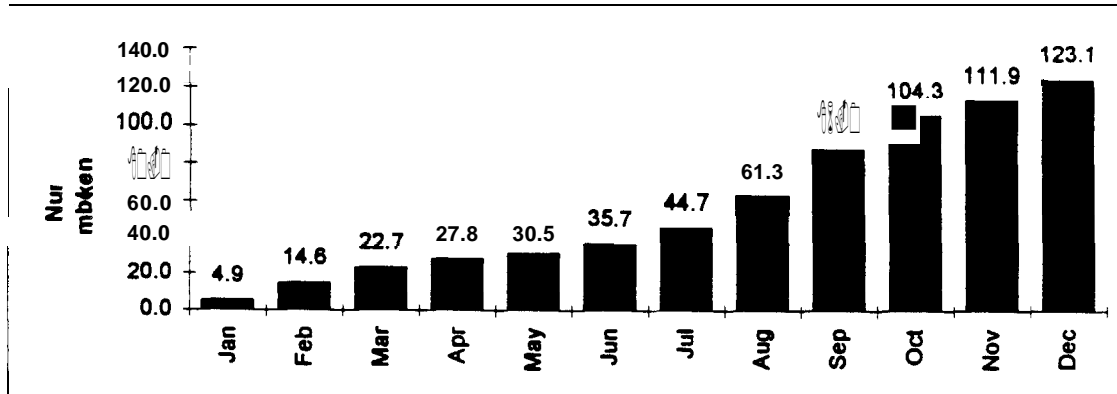
A. Percent Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE:

Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lion and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TAKE ESTIMATES: ALEUTIAN ISLANDS, 6993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	24	120	144
Surveyed Households	16	106	122
Sampling Fraction	66.7%	86.3%	34.7%
Sample Household Members	81	264	345
Estimated Household Members	91.5	323.3	414.0

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:
 used 80.4%
 Hunted 34.2%
 Harvested 24.3%
 Received 73.9%
 Gave Away 25.8%

Estimated Community Harvest and Take (Expanded):
 Total Number Harvested 85.0
 Total Number Struck and Lost 15.4
 Total Number Taken 100.4
 Number Harvested Per Capita 0.21

HARBOR SEAL HARVEST BY SEASON													Unknown		Total
	Jan	Fob	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	3	1	4	1	5	5	4	8	8	5	12	3	10	70	
Struck and Lost	0	1	0	1	0	0	1	4	2	1	0	1	1	12	
Total Take	3	2	4	2	5	5	5	12	10	5	12	4	11	52	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	4.5	1.5	4.0	1.1	7.5	5.5	5.5	10.0	10.5	5.9	13.2	3.7	10.9	85.0	
Struck and Lost	0.0	1.5	0.0	1.5	0.0	0.0	1.1	5.3	2.7	1.1	0.0	1.1	1.0	15.4	
Total Take	4.5	3.0	4.0	2.5	7.8	5.5	5.7	15.3	13.2	7.0	13.2	4.0	11.9	100.4	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	4.5	1.5	5.4	1.1	7.0	5.5	5.5	12.2	11.5	8.0	15.4	4.3		65.0	
Struck and Lost	0.1	1.5	0.1	1.6	0.1	0.1	1.2	5.4	2.9	1.2	0.1	1.2		15.4	
Total Take	4.5	3.1	5.5	2.7	7.9	5.7	5.8	17.5	14.4	9.2	15.5	5.4		100.4	
Total Take (%)	4.0%	3.1%	5.5%	2.7%	7.9%	5.5%	5.8%	17.5%	14.3%	9.2%	15.4%	5.4%		100%	
Cumulative Take	4.5	7.7	14.2	15.9	24.8	30.4	37.3	54.8	59.2	79.4	95.0	100.4			
Cum. Take (%)	4.6%	7.6%	14.1%	15.0%	24.7%	30.3%	37.1%	54.5%	58.9%	78.1%	94.5%	100.0%			

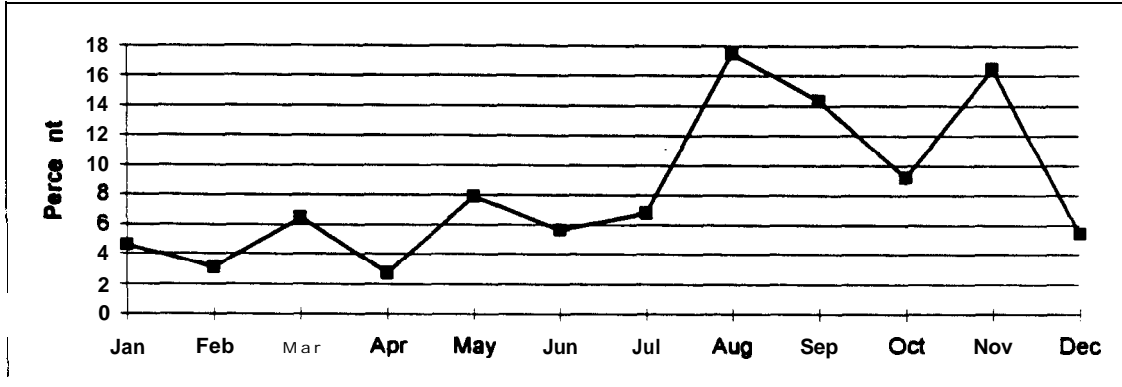
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)		Estimated By Community (Expanded)	
		Percent		Percent
Adult Male	19	27.1%	23.4	27.5%
Adult Female	9	12.9%	11.1	13.0%
Adult Unknown Sex	0	0.0%	0.0	0.0%
Juvenile Male	17	24.3%	20.7	24.3%
Juvenile Female	5	8.6%	7.9	9.3%
Juvenile Unknown Sex	2	2.9%	3.0	3.5%
Pup Male	1	1.4%	1.1	1.3%
Pup Female	5	7.1%	5.5	5.4%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	1	1.4%	1.5	1.5%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	10	14.3%	10.9	12.8%
Total	70	100.0%	85.0	100.0%

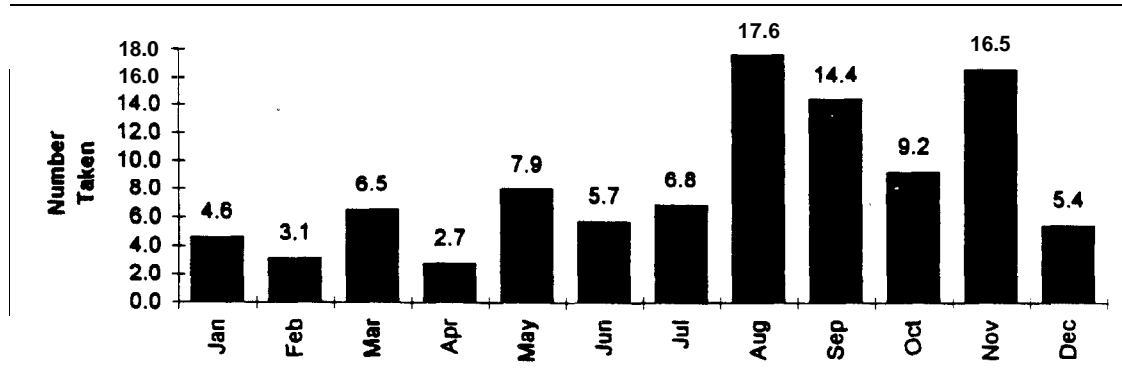
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TARE ESTIMATES: ALEUTIAN ISLANDS, 1993

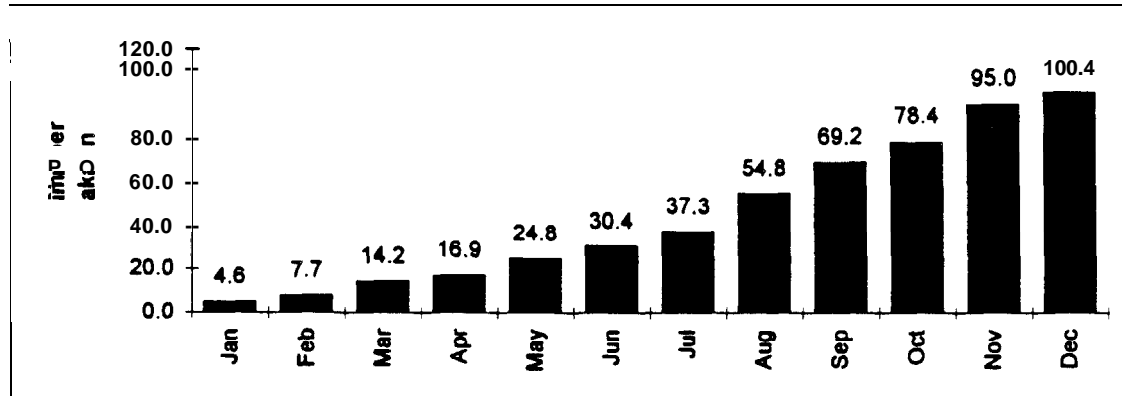
A Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TARE ESTIMATES: PRIBILOF ISLANDS, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	61	117	176
Surveyed Households	53	69	122
Sampling Fraction	66.9%	59.0%	66.5%
Sample Household Members	231	234	465
Estimated Household Members	265.9	408.9	674.6

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:
 used 5.1%
 Hunted 2.6%
 Harvested 1.3%
 Received 3.9%
 Gave Away 2.6%

Estimated Community Harvest and Take (Expanded):
 Total Number Harvested 2.3
 Total Number Struck and Lost 1.2
 Total Number Taken 3.5
 Number Harvested Per Capita 0.00

HARBOR SEAL HARVEST BY SEASON														Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total	
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	0	0	0	1	0	0	0	0	0	0	0	1	0	2	
Struck and Lost	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Total Take	0	1	0	1	0	0	0	0	0	0	0	1	0	3	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	2.3	
Struck and Lost	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	
Total Take	0.0	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	3.5	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2		2.3	
Struck and Lost	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.2	
Total Take	0.0	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2		3.5	
Total Take (%)	0.0%	33.3%	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%		100%	
Cumulative Take	0.0	1.2	1.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	3.5			
Cum. Take (%)	0.0%	33.3%	33.3%	55.7%	55.7%	56.7%	55.7%	55.7%	55.7%	55.7%	55.7%	100.0%			

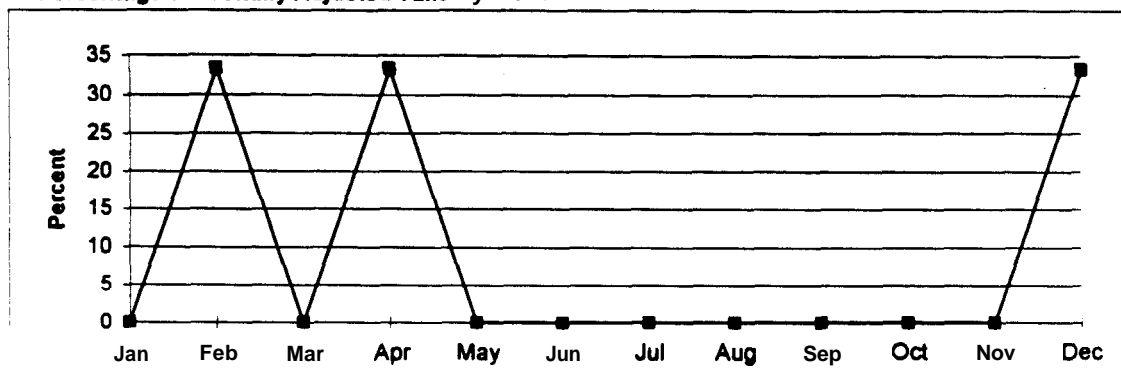
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)		Estimated By Community (Expanded)	
	Percent		Percent	
Adult Male	0	0.0%	0.0	0.0%
Adult Female	0	0.0%	0.0	0.0%
Adult Unknown Sex	1	50.0%	1.2	50.0%
Juvenile Male	1	50.0%	1.2	50.0%
Juvenile Female	0	0.0%	0.0	0.0%
Juvenile Unknown Sex	0	0.0%	0.0	0.0%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	0	0.0%	0.0	0.0%
Total	2	100.0%	2.3	100.0%

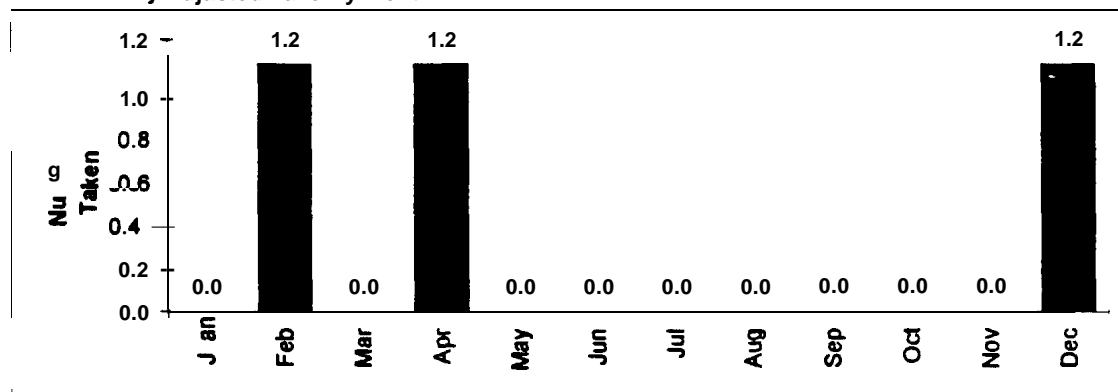
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: PRIBILOF ISLANDS, 1993

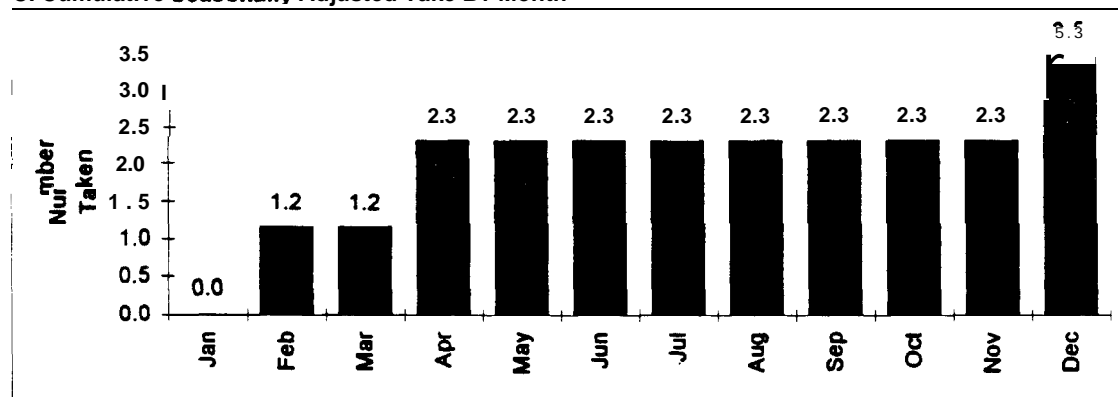
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (Phoca vitulina) HARVEST AND TAKE ESTIMATES: SOUTH BRISTOL BAY, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	19	263	282
Surveyed Households	14	186	200
Sampling Fmdion	73.7%	70.7%	70.9%
Sample Housahoid Members	61	546	607
Estimated Household Members	82.8	779.9	802.0

HARBOR SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	32.0%
Hunted	16.8%
Harvested	9.6%
Received	29.4%
Gave Away	12.0%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	73.6
Total Number Struck and Lost	57.3
Total Number Taken	130.9
Number Harvested Per Capita	0.09

HARBOR SEAL HARVEST BY SEASON													Unknown		Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	0	0	0	4	6	8	12	15	3	1	0	1	3	55	
Struck and Lost	0	0	0	0	2	2	17	13	6	1	0	0	4	45	
Total Take	0	0	0	4	10	10	29	28	9	2	0	1	7	100	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	0.0	0.0	0.0	4.5	11.7	11.4	16.6	19.3	4.0	1.3	0.0	1.1	3.0	73.6	
Struck and Lost	0.0	0.0	0.0	0.0	2.9	3.1	10.2	11.1	7.4	1.3	0.0	0.0	5.3	57.3	
Total Take	0.0	0.0	0.0	4.6	14.5	14.5	36.8	36.4	11.4	2.7	0.0	1.1	9.1	130.9	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	0.2	0.2	0.2	5.4	11.0	11.6	16.8	15.9	4.2	1.6	0.2	1.3		73.6	
Struck and Lost	0.0	0.0	0.0	0.0	3.0	3.3	20.9	16.0	10.6	1.3	0.0	0.0		57.3	
Total Take	0.2	0.2	0.2	5.4	14.9	16.0	37.7	37.9	16.0	2.0	0.2	1.3		130.9	
Total Take (%)	0.2%	0.2%	0.2%	4.1%	11.4%	11.4%	28.6%	29.0%	11.5%	2.2%	0.2%	1.0%		100%	
Cumulative Take	0.2	0.4	0.7	6.0	20.9	35.9	73.6	111.5	126.5	129.4	129.6	130.9			
Cum. Take (%)	0.2%	0.3%	0.5%	4.6%	16.0%	27.4%	56.2%	65.1%	96.6%	98.8%	99.0%	100.0%			

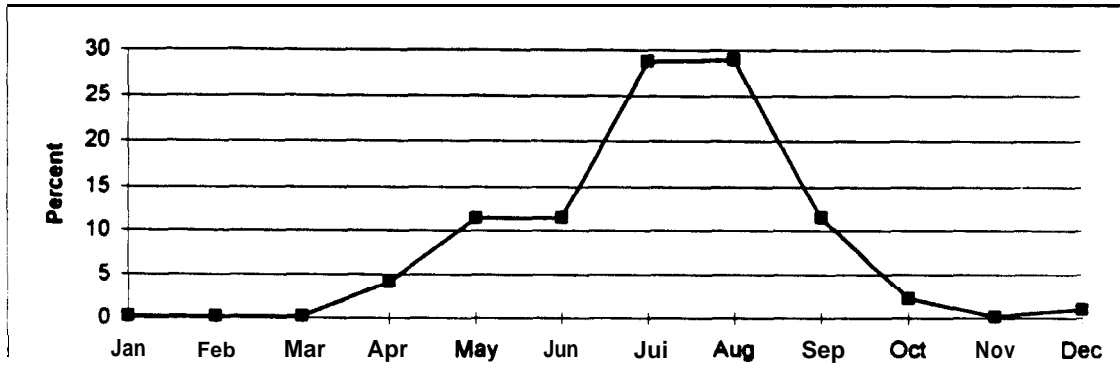
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	2	3.6%	2.7	3.6%
Adult Female	1	1.6%	1.5	2.1%
Adult Unknown Sex	42	76.4%	57.1	77.5%
Juvenile Male	3	5.5%	3.3	4.5%
Juvenile Female	0	0.0%	0.0	0.0%
Juvenile Unknown Sex	1	1.6%	1.1	1.5%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex ad Age	6	10.9%	6.0	10.9%
Total	55	100.0%	73.6	100.0%

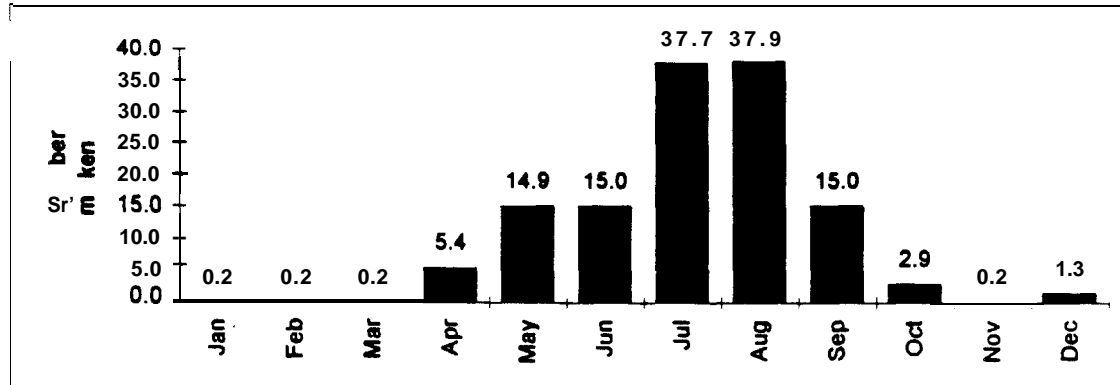
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: SOUTH BRISTOL BAY, 1993

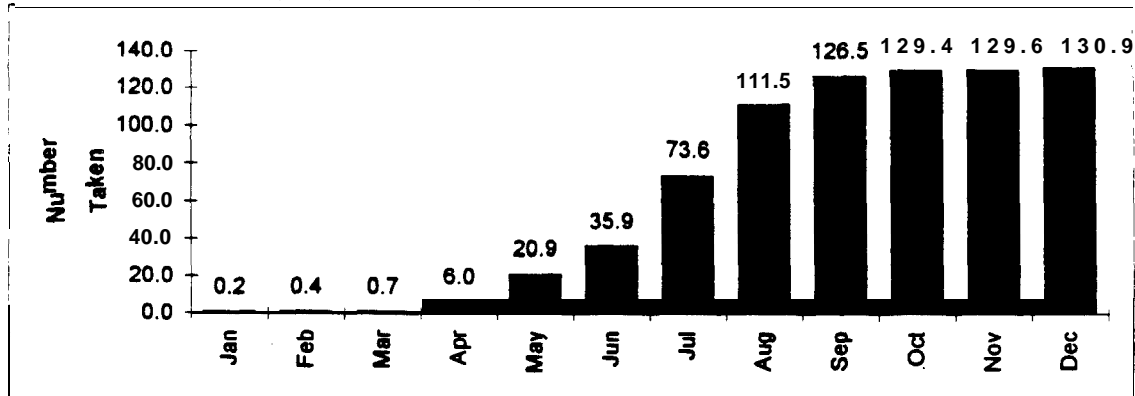
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL (*Phoca vitulina*) HARVEST AND TAKE ESTIMATES: NORTH BRISTOL BAY, 1993

SAMPLING DESIGN: CENSUS

	Active	Other	Total
Total Native Households	71	630	701
Surveyed Households	6	7	131
Sampling Fraction	94.4%	20.8%	28.2%
Sample Household Members	299	526	825
Estimated Household Members	316.9	2529.6	2846.5

ISSURIQ HARVEST AND USE INFORMATION

Percent Of Native Households:
 used 47.3%
 Hunted 19.2%
 Harvested 14.2%
 Received 39.8%
 Gave Away 24.4%

HARBOR SEAL HARVEST

Estimated Community Harvest and Take (Expanded):
 Total Number Harvested 46.1
 Total Number Struck and Lost 18.9
 Total Number Taken 65.0
 Number Harvested Per Capita 0.02

HARBOR SEAL HARVEST BY SEASON

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown Month	Total
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	4	3	6	10	0	0	0	0	23
Struck and Lost	0	0	0	0	0	1	4	2	7	0	0	0	0	14
Total Take	0	0	0	0	0	5	7	8	17	0	0	0	0	37
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	5.6	17.0	10.1	13.4	0.0	0.0	0.0	0.0	46.1
Struck and Lost	0.0	0.0	0.0	0.0	0.0	1.1	4.2	3.4	10.2	0.0	0.0	0.0	0.0	18.9
Total Take	0.0	0.0	0.0	0.0	0.0	6.7	21.2	13.5	23.5	0.0	0.0	0.0	0.0	65.0
ESTIMATE SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	5.6	17.0	10.1	13.4	0.0	0.0	0.0	0.0	46.1
Struck and Lost	0.0	0.0	0.0	0.0	0.0	1.1	4.2	3.4	10.2	0.0	0.0	0.0	0.0	18.9
Total Take	0.0	0.0	0.0	0.0	0.0	6.7	21.2	13.5	23.5	0.0	0.0	0.0	0.0	65.0
Total Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	10.3%	32.6%	20.0%	36.2%	0.0%	0.0%	0.0%	0.0%	100%
Cumulative Take	0.0	0.0	0.0	0.0	0.0	6.7	27.9	41.4	65.0	65.0	85.0	65.0	65.0	
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	10.3%	42.9%	63.8%	100.0%	100.0%	100.0%	100.0%	100.0%	

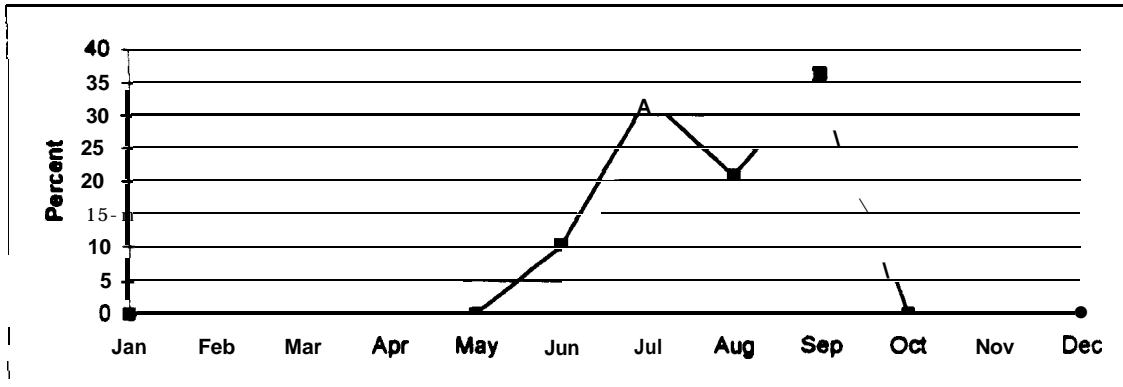
HARBOR SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)		Estimated By Community (Expanded)	
Adult Male	4.0	17.4%	7.9	17.2%
Adult Female	2.0	0.7%	2.2	4.7%
Adult Unknown Sex	9.0	39.1%	24.9	54.0%
Juvenile Male	3.0	13.0%	4.5	9.8%
Juvenile Female	1.0	4.3%	2.4	5.1%
Juvenile Unknown Sex	2.0	8.7%	2.1	4.6%
Pup Male	1.0	4.3%	1.0	2.2%
Pup Female	0.0	0.0%	0.0	0.0%
Pup Unknown Sex	0.0	0.0%	0.0	0.0%
Male Unknown Age	0.0	0.0%	0.0	0.0%
Female Unknown Age	0.0	0.0%	0.0	0.0%
Unknown Sex and Age	1.0	4.3%	1.0	2.3%
Total	23	100.0%	40.1	100.0%

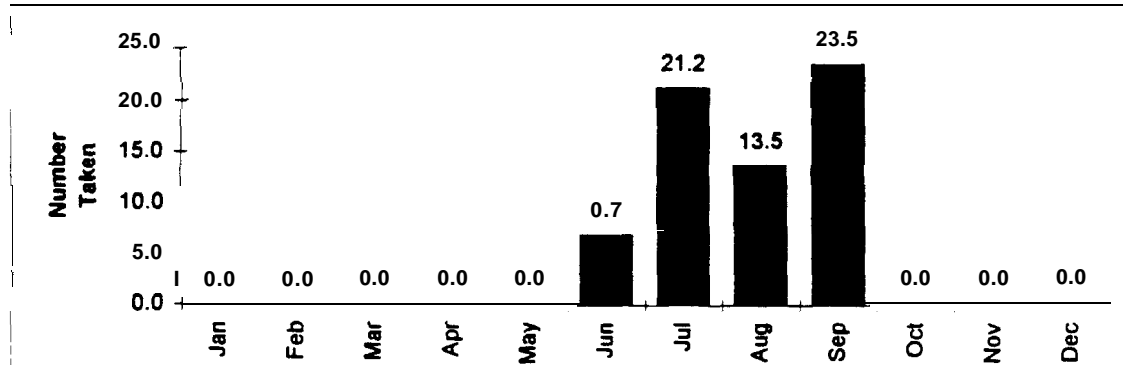
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska, 1993.

HARBOR SEAL (*Phoca vitulina*) TAKE ESTIMATES: NORTH BRISTOL BAY, 1992

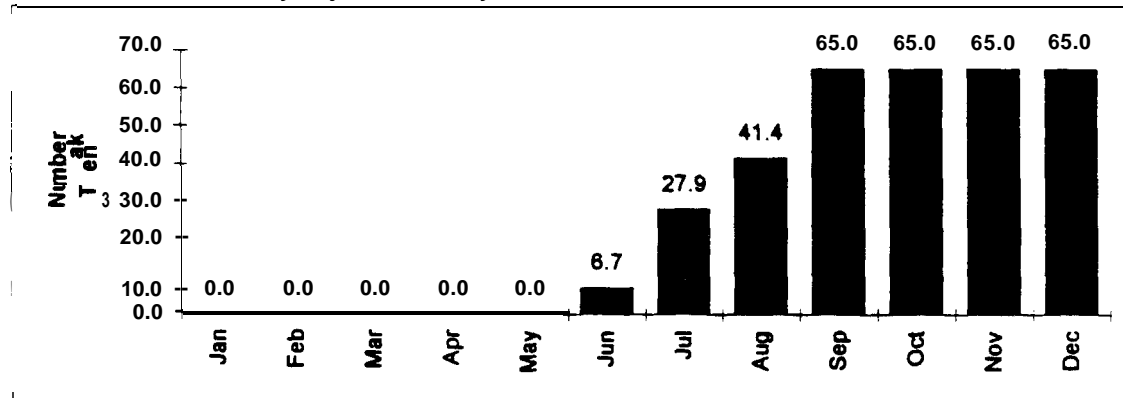
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitoring System for Sea Lions and Harbor Seals in Alaska, 1993.
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HARBOR SEAL & SPOTTED SEAL HARVEST AND TARE ESTIMATES: NORTH BRISTOL BAY, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	71	630	701
Surveyed Households	67	131	198
Sampling Fraction	94.4%	20.6%	26.2%
Sample Household Members	299	526	825
Estimated Household Members	317.1	22137.5	2604.6

HARBOR SEAL & SPOTTED SEAL HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	47.3%
Hunted	19.2%
Harvested	14.2%
Received	39.6%
Gave Away	24.4%

Estimated Community Harvest and Take (Expended):

Total Number Harvested	261.1
Total Number Strunk and Lost	69.1
Total Number Taken	330.2
Number Harvested Per Capita	0.10

HARBOR SEAL & SPOTTED SEAL HARVEST BY SEASON													Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	TOW
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	6	9	24	42	37	4	3	6	10	10	17	12	0	180
Struck and Lost	0	1	3	1	5	1	4	2	7	10	6	3	2	45
Total Take	6	10	27	43	42	5	7	8	17	20	23	15	2	225
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	10.3	12.2	30.8	46.5	54.3	5.6	17.0	10.1	13.4	13.4	27.4	16.1	0.0	281.1
Struck and Lost	0.0	1.1	3.3	1.1	6.0	1.1	4.2	3.4	10.2	16.0	11.6	4.6	4.7	69.1
Total Take	10.3	13.3	34.0	49.6	62.3	6.7	21.2	13.6	23.6	29.4	39.0	22.7	4.7	330.2
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	10.3	12.2	30.6	46.5	54.3	5.6	17.0	10.1	13.4	13.4	27.4	16.1		281.1
Struck and Lost	0.0	1.2	3.5	1.2	6.6	1.2	4.2	3.7	11.0	17.2	12.5	4.9		69.1
Total Take	10.3	13.4	34.3	49.7	62.9	6.8	21.2	13.6	24.3	30.6	39.9	23.0		330.2
Total Take (%)	3.1%	4.0%	10.4%	15.0%	19.0%	2.1%	6.4%	4.2%	7.4%	9.3%	12.1%	7.0%		100%
Cumulative Take	10.3	23.7	56.0	107.7	170.6	177.4	196.5	212.3	236.7	267.3	307.2	330.2		
Cum. Take (%)	3.1%	7.2%	17.6%	32.6%	51.7%	53.7%	60.1%	64.3%	71.7%	60.9%	93.0%	100.0%		

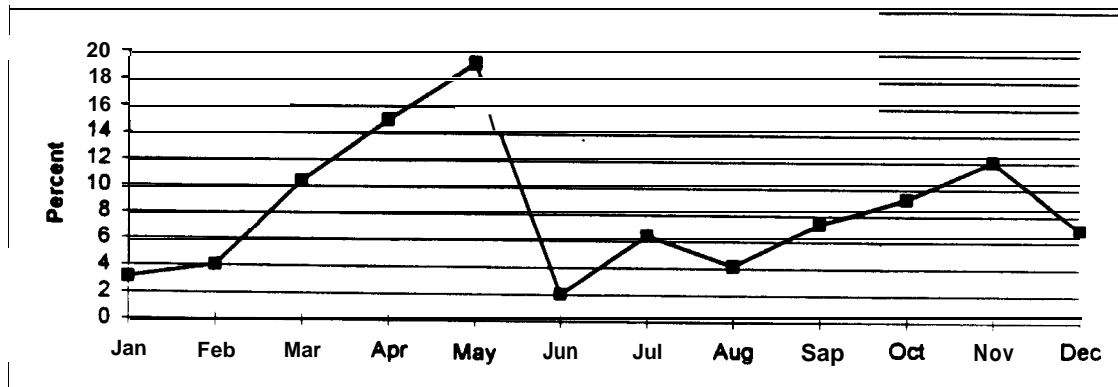
HARBOR SEAL & SPOTTED SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	43	23.9%	63.1	24.1%
Adult Female	14	7.8%	19.1	7.3%
Adult Unknown Sex	50	32.6%	100.2	36.4%
Juvenile Male	13	7.2%	17.7	6.6%
Juvenile Female	10	5.6%	13.4	5.1%
Juvenile Unknown Sex	31	17.2%	35.8	13.7%
Pup Male	2	1.1%	3.4	1.3%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	4	2.2%	4.4	1.7%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	1	0.6%	1.0	0.4%
Unknown Sex and Age	3	1.7%	3.1	1.2%
Total	160	100.0%	261.1	100.0%

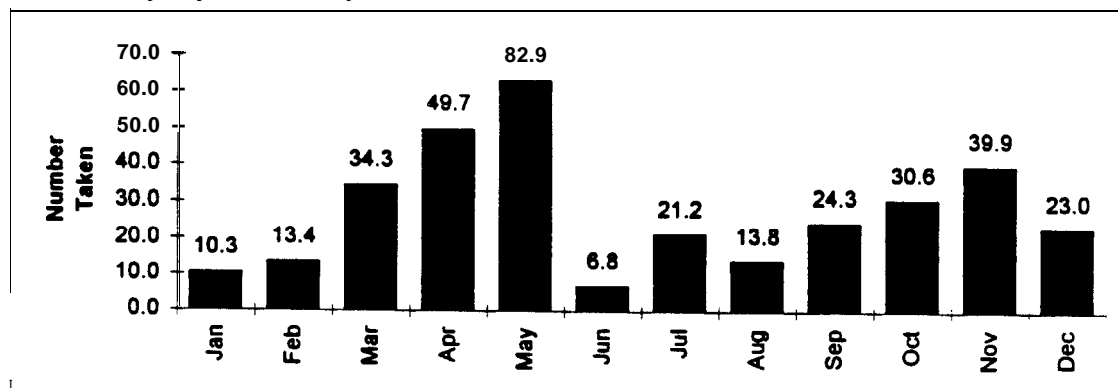
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

HARBOR SEAL AND SPOTTED SEAL TARE ESTIMATES: NORTH BRISTOL BAY, 1993

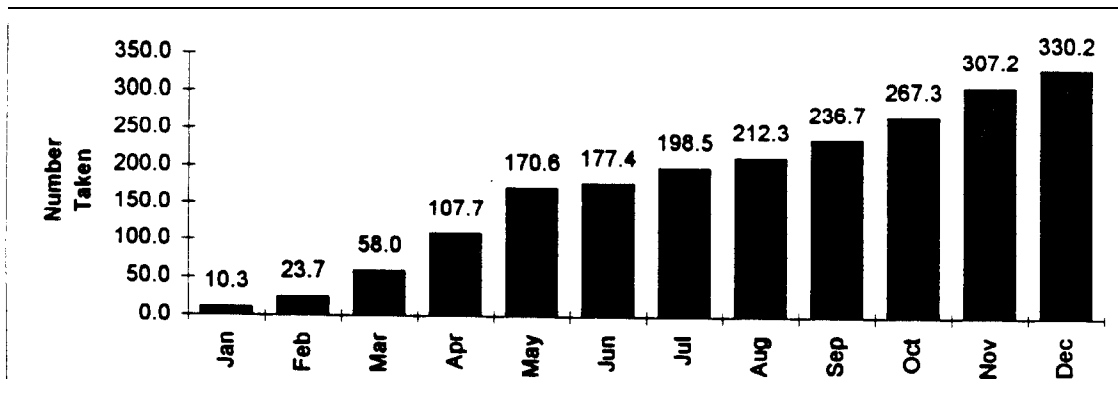
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SPOTTED SEAL (*Phoca largha*) HARVEST AND TARE ESTIMATES: NORTH BRISTOL BAY, 1993

SAMPLING DESIGN: CENSUS

	Active	Other	Total
Total Native Households	71	630	701
Surveyed Households	87	131	198
Sampling Fraction	94.4%	20.8%	28.2%
Sample Household Members	299	528	825
Estimated Household Members	318.9	2529.8	2846.5

ISSURIQ HARVEST AND USE INFORMATION

Percent Of Native Households:
 used 47.3%
 Hunted 19.2%
 Harvested 14.2%
 Received 39.6%
 Gave Away 24.4%

SPOTTED SEAL HARVEST

Estimated Community Harvest end Take (Expanded):
 Total Number Harvested 215.1
 Total Number Struck end Lost 50.2
 Total Number Taken 265.3
 Number Harvested Per Capita 0.08

SPOTTED SEAL HARVEST BY SEASON

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown Month	Total
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	6	9	24	42	37	0	0	0	0	10	17	12	0	157
Struck and Lost	0	1	3	1	5	0	0	0	0	10	6	3	2	31
Total Take	6	10	27	43	42	0	0	0	0	20	23	15	2	188
ESTIMATED HARVEST MD TAKE BY COMMUNITY (EXPANDED)														
Harvest	10.3	12.2	30.0	46.5	54.3	0.0	0.0	0.0	0.0	13.4	27.4	16.1	0.0	215.1
Struck and Lost	0.0	1.1	3.3	1.1	0.0	0.0	0.0	0.0	0.0	16.0	11.6	4.5	4.7	so. 2
Total Take	10.3	13.3	34.0	49.6	62.3	0.0	0.0	0.0	0.0	29.4	39.0	22.7	4.7	265.3
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	10.3	12.2	30.0	46.6	04.3	0.0	0.0	0.0	0.0	13.4	27.4	16.1		215.1
Struck and Lost	0.0	1.2	3.6	1.2	6.8	0.0	0.0	0.0	0.0	17.6	12.6	5.0		50.2
Total Take	10.3	13.4	34.4	49.7	63.1	0.0	0.0	0.0	0.0	31.0	46.2	23.1		260.3
Total Take (%)	3.9%	5.0%	13.0%	16.7%	23.6%	0.0%	0.0%	0.0%	0.0%	11.7%	15.1%	0.7%		10096
Cumulative Take	10.3	23.7	58.1	107.0	179.9	176.9	170.9	170.9	170.9	202.0	242.1	265.3		
Cum. Take (%)	3.9%	0.9%	21.9%	40.6%	64.4%	64.4%	64.4%	64.4%	64.4%	76.1%	91.3%	100.0%		

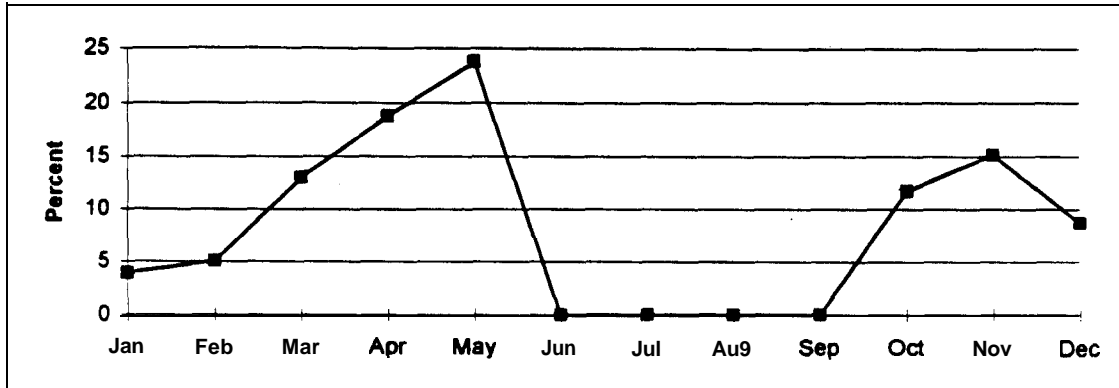
SPOTTED SEAL HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	39.0	24.6%	55.1	25.6%
Adult Female	12.0	7.6%	16.9	7.0%
Adult Unknown Sex	50.0	31.6%	75.3	35.0%
Juvenile Male	10.0	6.4%	13.2	6.1%
Juvenile Female	9.0	5.7%	11.0	5.1%
Juvenile Unknown Sex	29.0	16.6%	33.7	10.7%
Pup Male	1.0	0.6%	2.4	1.1%
Pup Female	0.0	0.0%	0.0	0.0%
Pup Unknown Sex	4.0	2.6%	4.4	2.0%
Male Unknown Age	0.0	0.0%	0.0	0.0%
Female Unknown Age	1.0	0.6%	1.0	0.6%
Unknown Sex and Age	2.0	1.3%	2.1	1.0%
Total	167	100.0%	215.1	100.0%

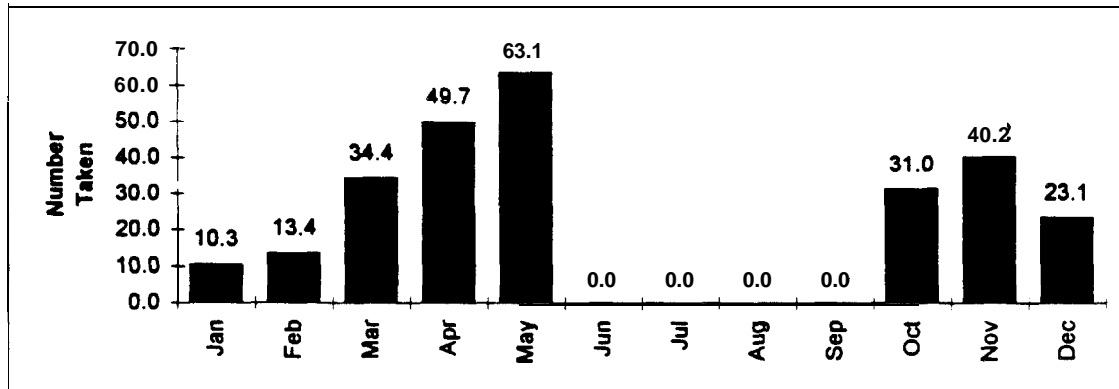
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska, 1993.

SPOTTED SEAL (*Phoca largha*) TAKE ESTIMATES: NORTH BRISTOL BAY, 1992

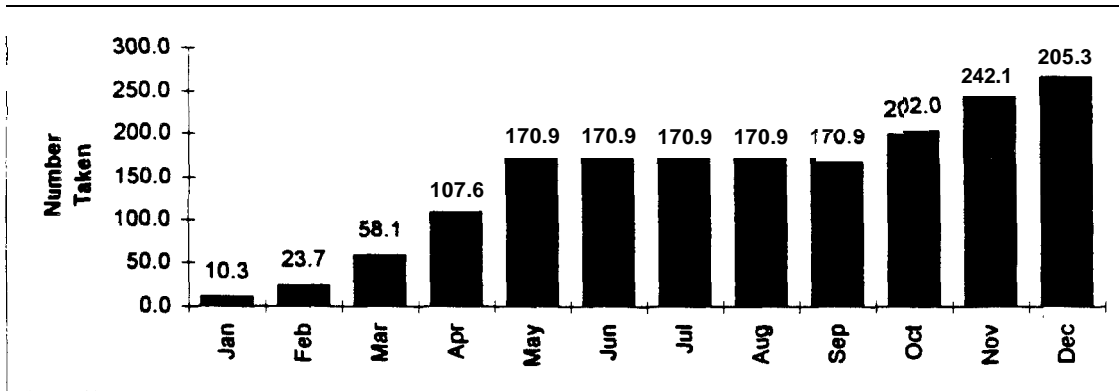
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska, 1993.
B-22

SEA LION (Eumetopias jubatus) HARVEST AND TAKE ESTIMATES: SOUTHEAST ALASKA, 1993

SAMPLING DESIGN: Mixed Chain *Referral*

	Active	Other	Total
Total Native Housahokis	524	657	1381
Surveyed Households	468	268	716
Sampling Fraction	87.4%	30.1%	51.8%
Sample Household Members	1714	669	2663
Estimated Household Members	1940.6	3028.5	4969.1

SEA LION HARVEST AND USE INFORMATION

Percent Of Nativ Households:

Used	N.A.
Hunted	N.A.
Harvested	N.A.
Received	N.A.
Gave Away	N.A.

Estimated Community Hwwst and Take (Expanded):

Total Number Harvested	0.0
Total Number Struck and Lost	1.1
Total Number Taken	1.1
Number Harvested Per Capita	N.A.

SEA LION HARVEST BY SEASON														Unknown
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck and Lost	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total Take	0	0	0	0	0	0	0	0	0	0	1	0	0	1
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck and Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Struck and Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0		1.1
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0		1.1
Total Take (W)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%		100%
Cumulative Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1		
Cum. Take (k)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%		

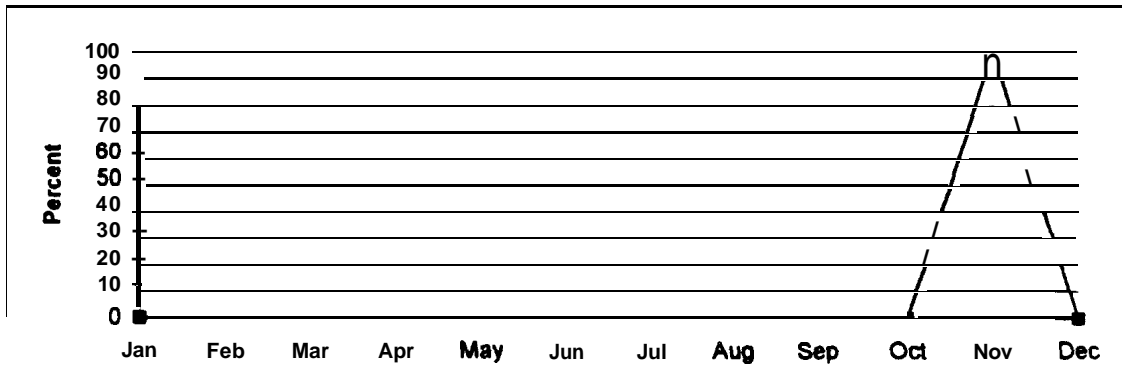
SEA LION HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	0	—	0.0	—
Adult Female	0	—	0.0	—
Adult Unknown Sex	0	—	0.0	—
Juvenile Male	0	—	0.0	—
Juvenile Female	0	—	0.0	—
Juvenile Unknown Sex	0	—	0.0	—
PUP Male	0	—	0.0	—
Pup Female	0	—	0.0	—
Pup Unknown Sex	0	—	0.0	—
Male Unknown Age	0	—	0.0	—
Female Unknown Age	0	—	0.0	—
Unknown Sex and Age	0	—	0.0	—
Total	0	—	0.0	—

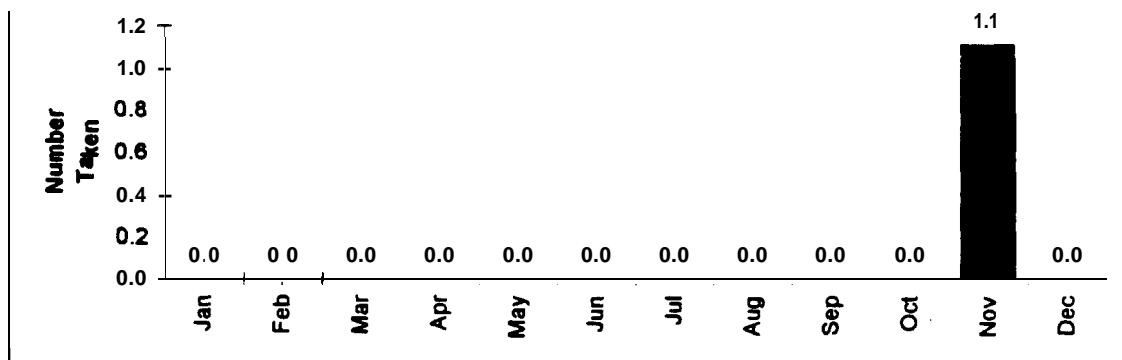
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: SOUTHEAST ALASKA, 1993

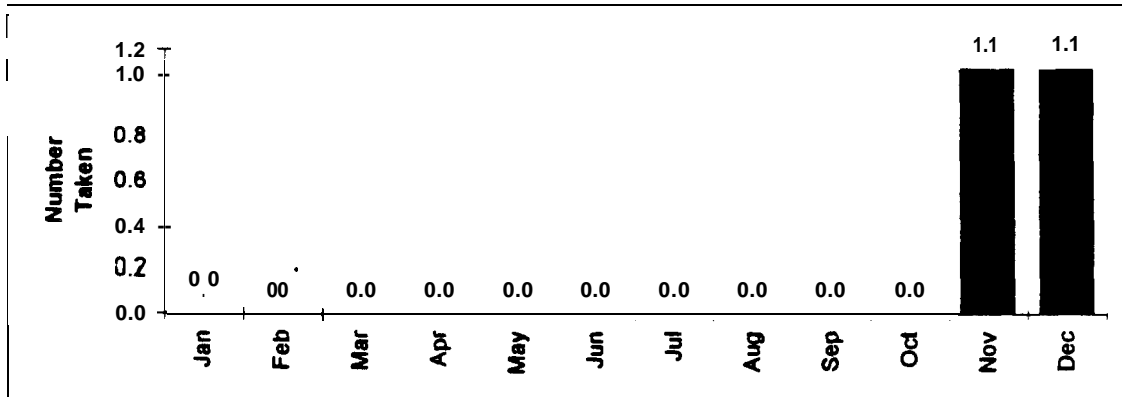
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) HARVEST AND TAKE ESTIMATES: NORTH PACIFIC RIM, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	35	507	642
Surveyed Households	29	198	227
Sampling Fraction	82.9%	39.1%	41.9%
Sample Household Members	102	605	707
Estimated Household Members	121.1	1367.3	1468.4

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	N.A.
Hunted	N.A.
Harvested	N.A.
Received	N.A.
Gave Away	N.A.

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	26.5
Total Number Struck and Lost	8.8
Total Number Taken	35.2
Number Harvested Per Capita	0.02

SEA LION HARVEST BY SEASON														Unknown Month	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	3	1	0	2	0	1	1	1	1	0	4	3	7	24	
Struck and Lost	0	0	0	0	0	1	0	0	1	0	3	0	3	8	
Total Take	3	1	0	2	0	2	1	1	2	0	7	3	10	32	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	3.3	1.1	0.0	2.5	0.0	1.1	1.1	1.1	1.1	0.0	4.4	3.3	7.5	28.5	
Struck and Lost	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1	0.0	3.3	0.0	3.2	8.8	
Total Take	3.3	1.1	0.0	2.5	0.0	2.2	1.1	1.1	2.2	0.0	7.7	3.3	10.7	37.3	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	3.3	1.1	0.0	5.6	0.0	2.2	2.2	1.1	1.1	0.0	5.5	4.4		26.5	
Struck and Lost	0.1	0.1	0.1	0.1	0.1	1.2	0.1	0.1	1.2	0.1	5.1	0.1		8.8	
Total Take	3.4	1.2	0.1	5.7	0.1	3.4	2.3	1.2	2.3	0.1	10.6	4.5		35.3	
Total Take (%)	9.5%	3.4%	0.2%	16.3%	0.2%	9.5%	6.4%	3.4%	6.1%	0.2%	30.0%	12.7%		100%	
Cumulative Take	3.4	4.5	4.6	10.4	10.4	13.8	16.1	17.3	20.1	26.2	30.6	35.2			
Cum. Take (%)	9.5%	12.6%	13.1%	29.4%	29.6%	39.2%	45.6%	49.0%	57.1%	57.3%	67.3%	100.0%			

SEA LION HARVEST BY AGE AND SEX

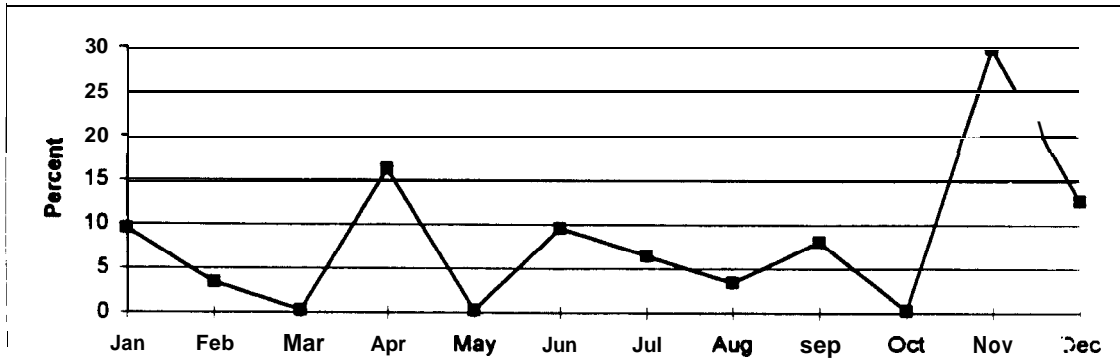
	Reported		Estimated	
	By Sample (Unexpanded)	Percent	By Community (Expanded)	Percent
Adult Male	5	20.8%	5.5	20.7%
Adult Female	1	4.2%	1.1	4.2%
Adult Unknown Sex	5	20.8%	5.9	22.1%
Juvenile Male	4	16.7%	4.3	16.2%
Juvenile Female	3	12.5%	3.3	12.5%
Juvenile Unknown Sex	2	8.3%	2.2	8.4%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	4	16.7%	4.2	15.9%
Total	24	100.0%	26.5	100.0%

SOURCE

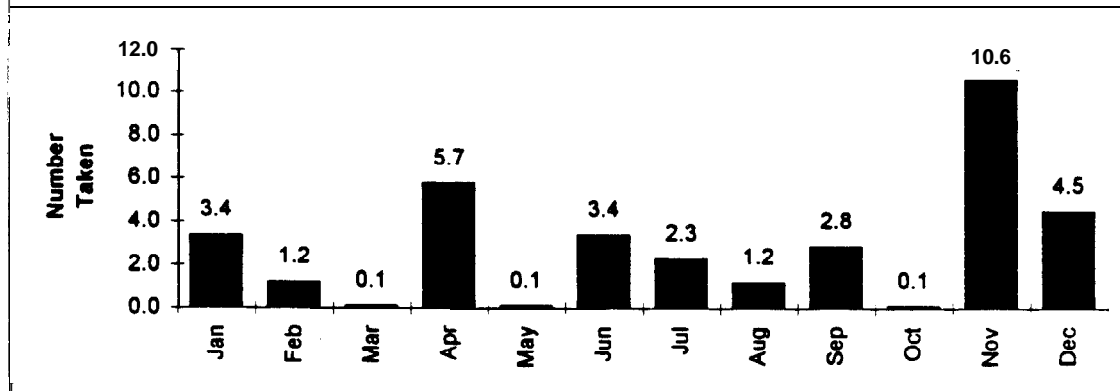
Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: NORTH PACIFIC RIM, 1993

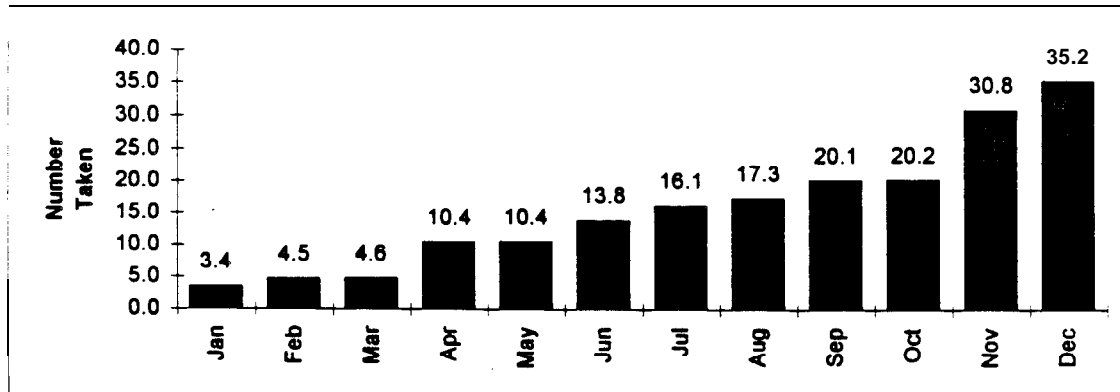
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) HARVEST AND TAKE **ESTIMATES**: UPPER KENAI - COOK INLET, 1993

SAMPLING DESIGN: MIXED

Total Native Households 54
 Surveyed Households 43
 Sampling Fraction 79.6%
 Sample Household Members 151
 Estimated Household Members 161.3

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

Used N.A.
 Hunted N.A.
 Harvested N.A.
 Received N.A.
 Gave Away N.A.

Estimated Community Harvest and Take (Expanded):

Total Number Harvested 7.6
 Total Number Struck and Lost 3.3
 Total Number Taken 11.1
 Number Harvested Per Capita 0.04

SEA LION HARVEST BY SEASON													Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	2	1	0	2	0	0	0	1	0	1	0	0	0	7
Struck and Lost	0	2	0	0	0	0	0	0	1	0	0	0	0	3
Total Take	2	3	0	2	0	0	0	1	1	1	0	0	0	10
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	2.2	1.1	0.0	2.2	0.0	0.0	0.0	1.1	0.0	1.1	0.0	0.0	0.0	7.6
Struck and Lost	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	3.3
Total Take	2.2	3.3	0.0	2.2	0.0	0.0	0.0	1.1	1.1	1.1	0.0	0.0	0.0	11.1
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	2.2	1.1	0.0	2.2	0.0	0.0	0.0	1.1	0.0	1.1	0.0	0.0		7.6
struck And Lost	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0		3.3
Total Take	2.2	3.3	0.0	2.2	0.0	0.0	0.0	1.1	1.1	1.1	0.0	0.0		11.1
Total Take (%)	20.0%	30.0%	0.0%	20.0%	0.0%	0.0%	0.0%	10.0%	10.6%	10.6%	0.0%	0.0%		100%
Cumulative Take	2.2	6.6	5.6	7.8	7.8	7.6	7.6	8.9	10.0	11.1	11.1	11.1		
Cum. Take (%)	20.0%	50.0%	60.0%	70.0%	70.0%	70.0%	70.0%	80.0%	90.0%	100.0%	100.0%	100.0%		

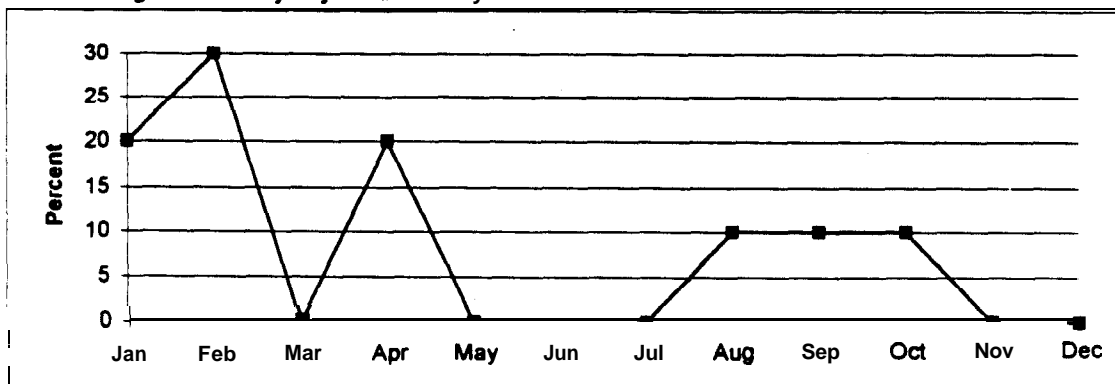
SEA LION HARVEST BY AGE AND SEX

	Reported		Estimated	
	By Sample	Percent	By Community	Percent
	(Unexpanded)		(Expanded)	
Adult Male	2	26.6%	2.2	26.6%
Adult Female	2	26.6%	2.2	26.6%
Adult Unknown Sex	1	14.3%	1.1	14.3%
Juvenile Male	1	14.3%	1.1	14.3%
Juvenile Female	0	0.0%	0.0	0.0%
Juvenile Unknown Sex	0	0.0%	0.0	0.0%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	1	14.3%	1.1	14.3%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	0	0.0%	0.0	0.0%
Total	7	100.0%	7.6	100.0%

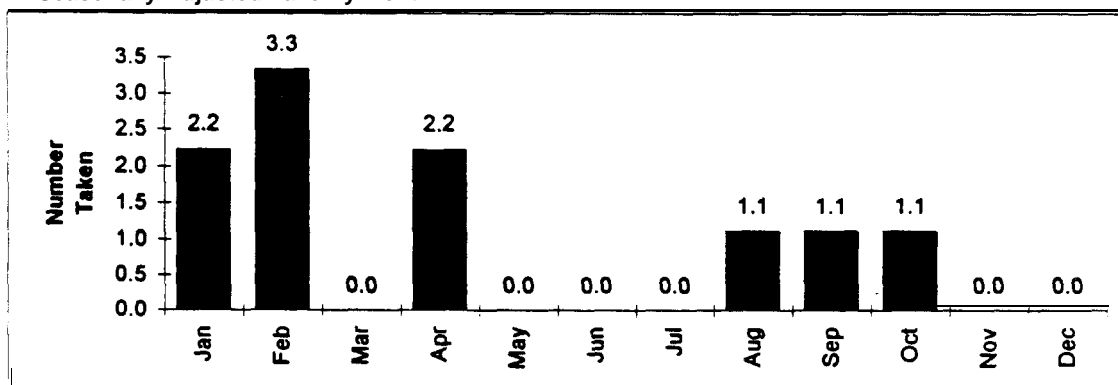
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: UPPER KENAI - COOK INLET, 1993

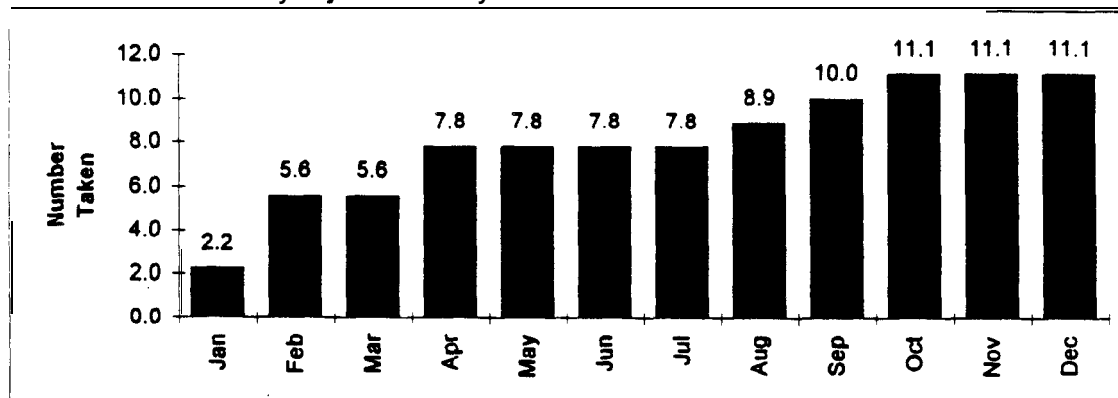
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) HARVEST AND TAKE ESTIMATES: KODIAK ISLAND, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	45	642	687
Surveyed Households	U	219	263
Sampling Fraction	97.8%	34.1%	38.3%
Sample Household Members	178	688	866
Estimated Household Members	182.1	1902.5	2084.6

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

Used	17.8%
Hunted	7.5%
Harvested	4.3%
Received	16.3%
Gave Away	5.4%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	41.6
Total Number Struck and Lost	16.9
Total Number Taken	58.5
Number Harvested Per Capita	0.02

SEA LION HARVEST BY SEASON

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	2	2	2	3	2	0	0	5	4	10	3	3	36
Struck and Lost	0	0	0	0	2	1	0	0	1	1	0	0	0	5
Total Take	0	2	2	2	5	3	0	0	6	5	10	3	3	41
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.7	2.1	3.0	3.6	2.0	0.0	0.0	6.6	4.1	11.7	3.1	3.3	41.6
Struck and Lost	0.0	0.0	0.0	0.0	2.2	1.0	0.0	0.0	12.7	1.0	0.0	0.0	0.0	16.9
Total Take	0.0	2.7	2.1	3.0	5.9	3.0	0.0	0.0	16.5	5.1	11.7	3.1	3.3	58.5
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.7	2.1	3.0	6.4	2.0	0.0	0.0	5.8	4.1	13.3	3.1		41.6
Struck and Lost	0.0	0.0	0.0	0.0	2.2	1.0	0.0	0.0	12.7	1.0	0.0	0.0		16.9
Total Take	0.0	2.7	2.1	3.0	7.6	3.0	0.0	0.0	16.5	5.1	13.3	3.1		58.5
Total Take (%)	0.0%	4.6%	3.6%	5.2%	12.9%	5.2%	0.0%	0.0%	31.6%	8.6%	22.7%	6.3%		100%
Cumulative Take	0.0	2.7	4.6	7.6	16.4	16.4	16.4	16.4	36.9	42.0	66.3	66.4		
Cum. Take (%)	0.0%	4.6%	8.1%	13.3%	26.3%	31.5%	31.5%	31.5%	63.0%	71.6%	94.5%	99.0%		

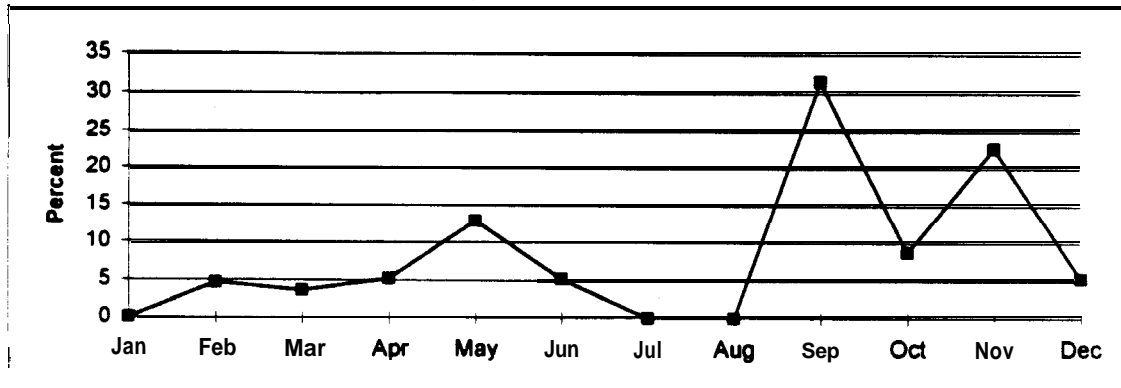
SEA LION HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)		Estimated By Community Percent (Expanded)	
Adult Male	12	33.3%	13.6	32.6%
Adult Female	6	16.7%	6.2	15.0%
Adult Unknown Sex	1	2.6%	1.0	2.5%
Juvenile Male	12	33.3%	15.2	36.6%
Juvenile Female	0	0.0%	0.0	0.0%
Juvenile Unknown Sex	2	5.6%	2.2	5.2%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	3	6.3%	3.3	7.6%
Total	36	100.0%	41.6	100.0%

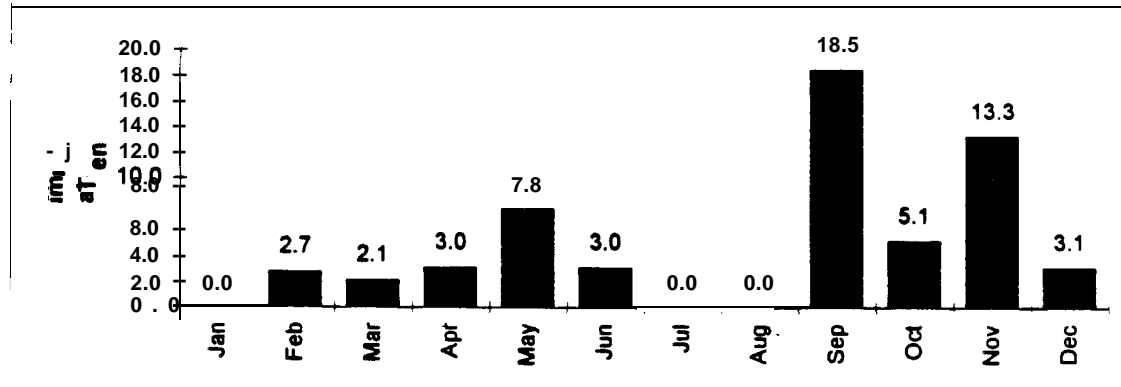
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: KODIAK ISLAND, 1993

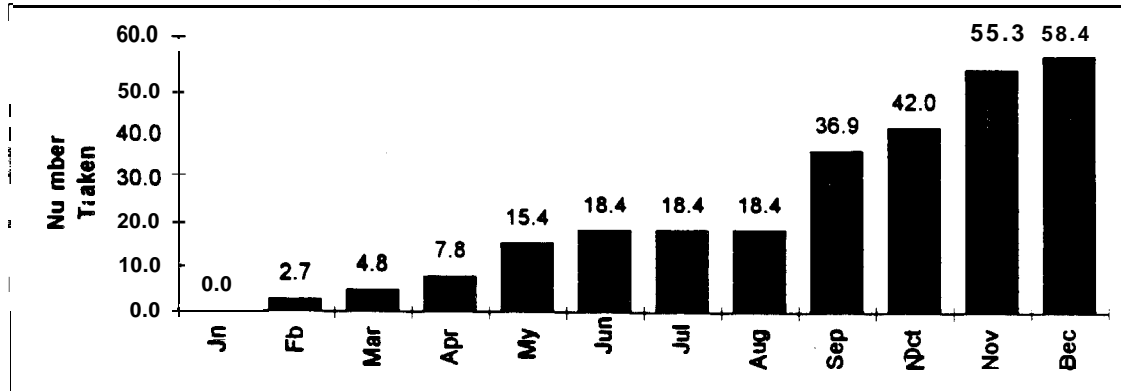
A Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (Eumetopias jubatus) HARVEST AND TAKE ESTIMATES: SOUTH ALASKA PENINSULA, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	28	397	395
Surveyed Households	24	172	198
Sampling Fraction	85.7%	49.9%	49.9%
Sample Household Members	95	599	694
Estimated Household Member	110.8	1242.3	1353.2

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

used	2.8%
Hunted	2.3%
Harvested	1.2%
Received	1.7%
Gave Away	0.9%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	4.6
Total Number Struck and Lost	1.2
Total Number Taken	5.7
Number Harvested Per Capita	0.00

SEA LION HARVEST BY SEASON														Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total	
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)															
Harvest	0	0	2	0	0	0	0	0	0	2	0	0	0	4	
Struck and Lost	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Total Take	0	0	3	0	0	0	0	0	0	2	0	0	0	5	
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	4.6	
Struck and Lost	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	
Total Take	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	5.7	
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)															
Harvest	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	4.6	
Struck and Lost	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	
Total Take	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	5.7	
Total Take (%)	0.0%	0.0%	61.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	0.0%	100%	
Cumulative Take	0.0	0.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5.7	5.7	5.7	5.7		
Cum. Take (%)	0.0%	0.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	100.0%	100.0%	100.0%	100.0%		

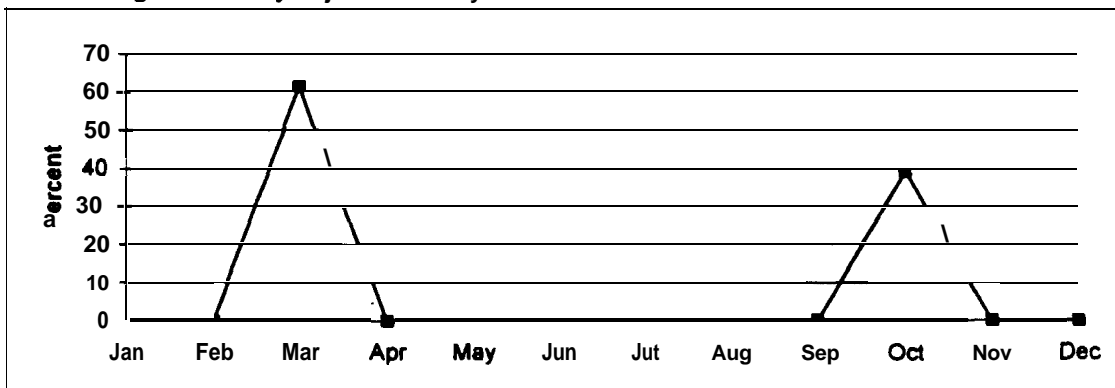
SEA LION HARVEST BY AGE AND SEX

	Reported		Estimated	
	By Sample	Percent	By Community	Percent
	(Unexpanded)		(Expanded)	
Adult Male	1	25.0%	1.1	22.4%
Adult Female	0	0.0%	0.0	0.0%
Adult Unknown Sex	0	0.0%	0.0	0.0%
Juvenile Male	0	0.0%	0.0	0.0%
Juvenile Female	1	25.0%	1.2	25.6%
Juvenile Unknown Sex	2	60.0%	2.3	51.1%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	0	0.0%	0.0	0.0%
Total	4	100.0%	4.6	100.0%

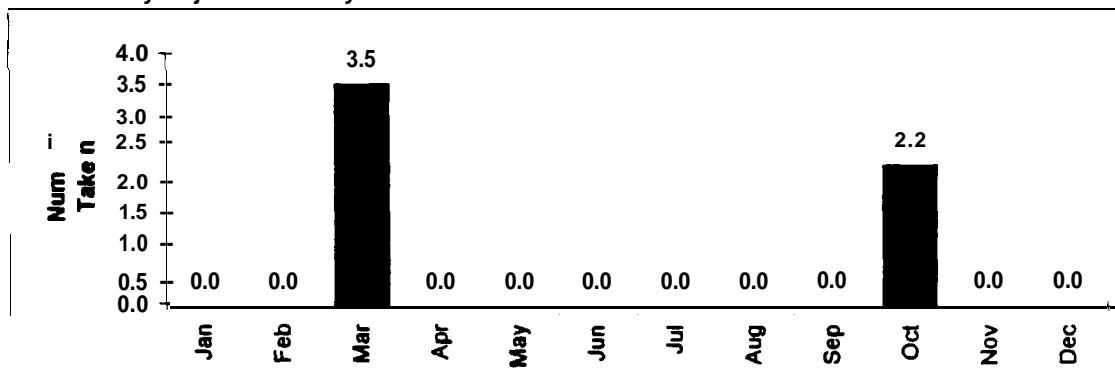
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: SOUTH ALASKA PENINSULA, 1993

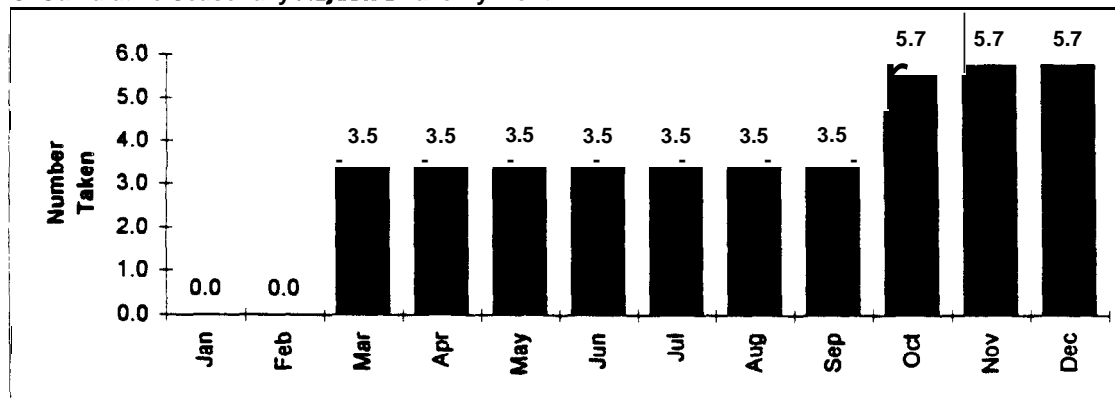
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitoring System for Sea Lions and Harbor Seals in Alaska.

SEA UON (Eumetopias jubatus) HARVEST AND TAKE ESTIMATES: ALEUTIAN ISLANDS, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	24	120	144
Surveyed Households	18	106	122
Sampling Fraction	88.7%	88.3%	84.7%
Sample Household Members	61	284	345
Estimated Household Members	91.5	323.3	414.8

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

used 95.4%
Hunted 32.3%
Harvested 25.1%
Received 88.8%
Gave Away 28.9%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested 99.0
Total Number Struck and Lost 24.8
Total Number Taken 123.8
Number Harvested Per Capita 0.24

SEA LION HARVEST BY SEASON													Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	8	1	8	3	4	7	3	3	10	10	13	3	5	78
Struck and Lost	1	1	4	0	1	2	2	0	2	6	0	0	0	19
Total Take	9	2	12	3	5	9	5	3	12	16	13	3	5	97
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	11.2	1.5	11.2	4.2	5.2	8.6	4.1	3.1	13.1	12.3	15.1	3.3	5.5	99.0
Struck and Lost	1.5	1.5	5.7	0.0	1.1	2.6	2.6	0.0	2.6	7.2	0.0	0.0	0.0	24.6
Total Take	12.7	3.0	16.9	4.2	6.3	11.2	6.7	3.7	16.7	10.4	16.1	3.3	6.5	123.6
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	11.0	1.5	11.2	4.2	5.2	8.6	4.1	4.0	14.0	13.2	17.3	3.9		99.0
Struck and Lost	1.5	1.6	5.7	0.0	1.0	2.6	2.6	0.0	2.6	7.2	0.0	0.0		24.6
Total Take	13.3	3.0	16.9	4.2	6.3	11.2	6.7	4.0	16.6	20.3	17.3	3.9		123.6
Total Take (W)	10.7%	2.4%	13.7%	3.4%	5.1%	9.0%	5.4%	3.2%	13.4x	16.4%	13.91	3.2%		100%
Cumulative Take	13.3	16.3	33.2	37.4	43.0	55.0	61.7	65.1	82.3	102.7	119.9	123.0		
Cum. Take (%)	10.7%	13.2%	26.0%	30.2%	35.3%	44.4%	49.8%	53.1%	66.5%	62.9%	96.8%	100.0%		

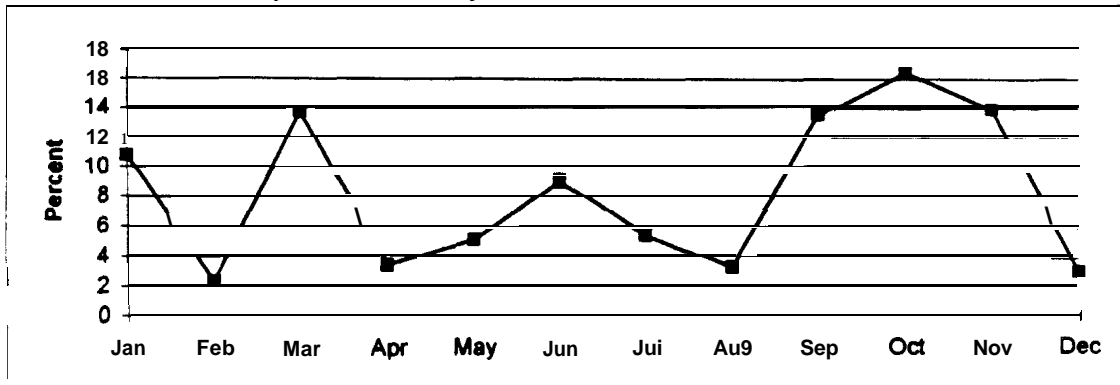
SEA LION HARVEST BY AGE AND SEX

	Reported		Estimated	
	By Sample (Unexpanded)	Percent	By Community (Expanded)	Percent
Adult Male	31	39.7%	36.9	39.3%
Adult Female	14	17.9%	16.5	16.7%
Adult Unknown Sex	0	0.0%	0.0	0.0%
Juvenile Male	11	14.1%	14.6	14.8%
Juvenile Female	10	12.8%	13.4	13.5%
Juvenile Unknown Sex	1	1.3%	1.1	1.1%
Pup Male	3	3.8%	4.5	4.5x
Pup Female	3	3.0%	4.5	4.5%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	5	6.4%	5.5	5.5%
Total	70	100.0%	99.0	160.0%

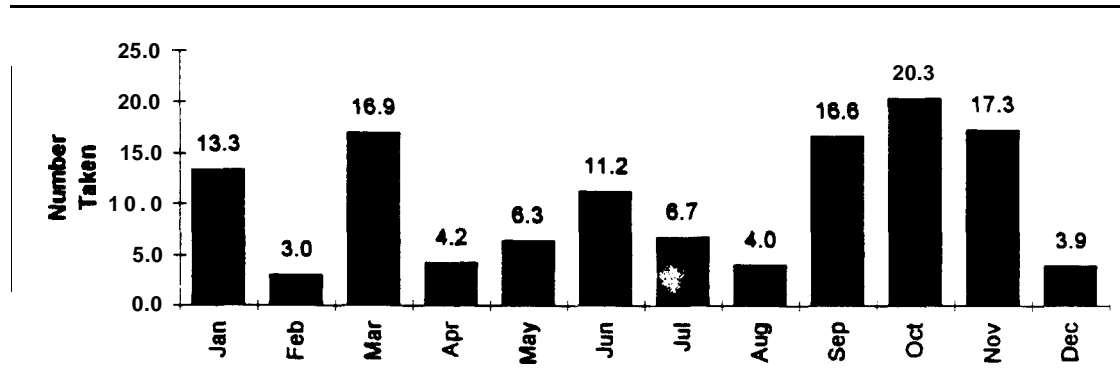
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: ALEUTIAN ISLANDS, 1993

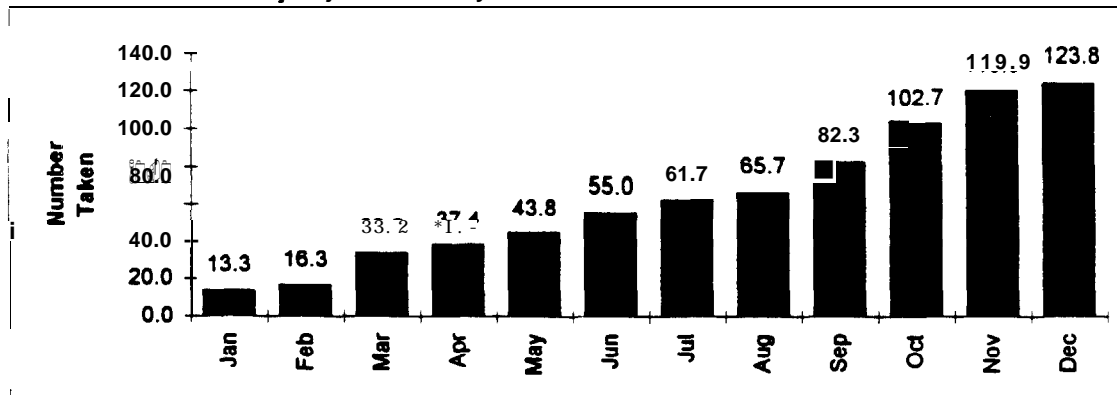
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) HARVEST AND TARE ESTIMATES: PRIBILOF ISLANDS, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	61	117	178
Surveyed Households	53	69	122
Sampling Fmdion	86.9%	59.0%	68.5%
Sample Household Members	231	234	465
Estimated Household Members	265.9	496.9	674.8

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:
 Used 80.8%
 Hunted 43.7%
 Harvested 32.2%
 Received 67.3%
 Gave Away 34.7%

Estimated community Harvest and Take (Expanded):
 Total Number Harvested 165.4
 Total Number Struck and Lost 80.0
 Total Number Taken 245.4
 Number Harvested Per Capita 0.25

SEA LION HARVEST BY SEASON													Unknown	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	4	6	7	7	6	0	0	3	23	20	7	7	40	130
Struck and Lost	3	3	7	1	1	0	0	0	4	8	12	1	19	59
Total Take	7	9	14	8	7	0	0	3	27	28	19	8	59	189
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	6.0	7.0	6.1	6.1	6.9	0.0	0.0	3.5	20.5	25.3	9.2	6.1	56.0	166.4
Struck and Lost	3.5	3.6	0.4	1.2	1.2	0.0	0.0	0.0	4.6	10.3	16.5	1.2	29.0	80.0
Total Take	10.3	10.4	16.5	9.4	6.1	0.0	0.0	3.5	31.1	36.6	25.6	9.2	66.6	245.4
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	10.4	10.0	12.3	11.8	10.6	0.0	0.0	6.3	46.6	30.1	14.0	12.3		165.4
Struck and Lost	6.9	6.9	11.9	1.5	2.0	0.0	0.0	0.0	1.9	17.0	25.1	2.0		80.0
Total Take	16.4	16.0	24.2	13.3	12.5	0.0	0.0	5.3	46.4	55.8	39.1	14.3		245.4
Total Take (%)	6.7%	6.5%	9.9%	5.4%	5.1%	0.0%	0.0%	2.2%	19.7%	22.8%	15.9%	5.8%		100%
Cumulative Take	16.4	32.4	56.6	69.9	82.4	82.4	82.4	87.7	136.1	192.0	231.1	245.4		
Cum. Take (%)	6.7%	13.2%	23.1%	28.5%	33.6%	33.6%	33.6%	35.7%	55.5%	78.2%	94.2%	100.0%		

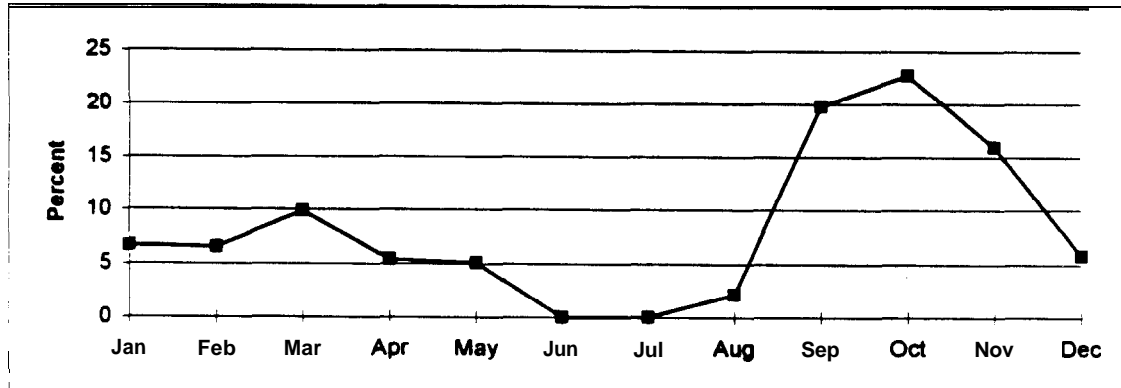
SEA LION HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	6	6.2%	9.2	5.6%
Adult Female	0	0.0%	0.0	0.0%
Adult Unknown Sex	1	0.0%	1.2	0.7%
Juvenile Male	02	63.1%	102.1	61.6%
Juvenile Female	1	0.0%	1.2	0.7%
Juvenile Unknown Sex	23	11.7%	34.3	20.7%
Pup Male	10	7.7%	11.6	7.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	4	3.1%	4.6	2.6%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	1	0.0%	1.2	0.7%
Total	130	100.0%	166.4	100.0%

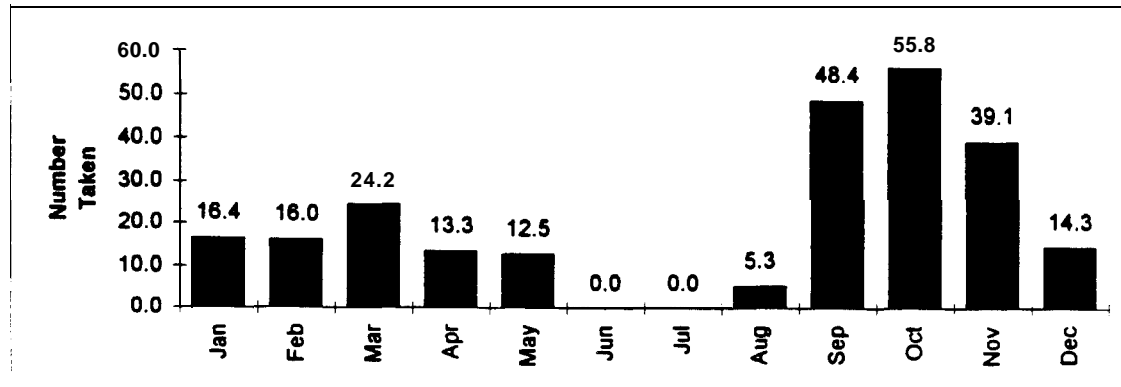
SOURCE: Alaska Department of Fish and Game, Division of Subsistence. Subsistence study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TARE ESTIMATES: PRIBILOF ISLANDS, 1993

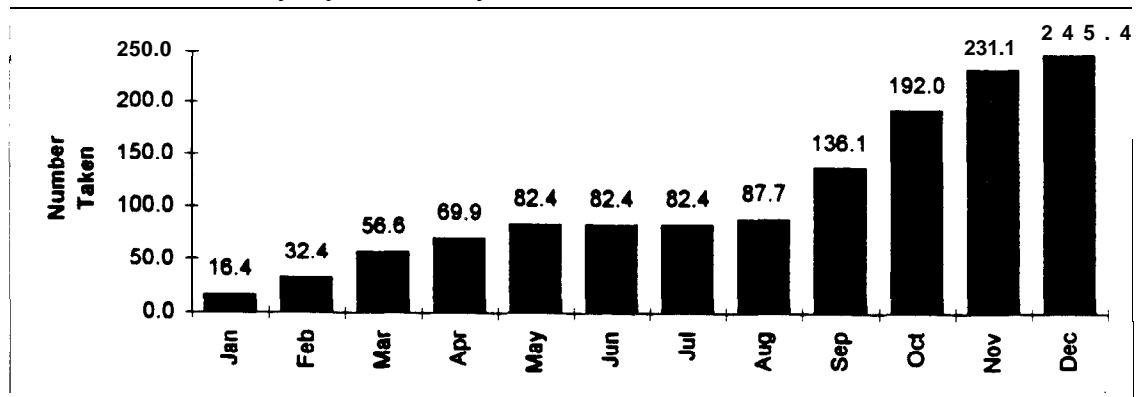
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) HARVEST AND TAKE ESTIMATES: SOUTH BRISTOL BAY, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Natiie Households	19	263	282
Surveyed Households	14	86	200
Sampling Fraction	73.7%	70.7%	70.9%
Sample Household Members	61	546	507
Estimated Household Members	62.6	779.9	842.6

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

used	0.0%
Hunted	0.5%
Harvested	0.0%
Received	0.0%
Gave Away	0.0%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	0.0
Total Number Struck and Lost	0.0
Total Number Taken	0.0
Number Harvested Per Capita	0.00

SEA LION HARVEST BY SEASON													Unknown	
	Jan	Fob	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck and Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck and Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Struck and Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take (%)	—	—	—	—	—	—	—	—	—	—	—	—		
Cumulative Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		

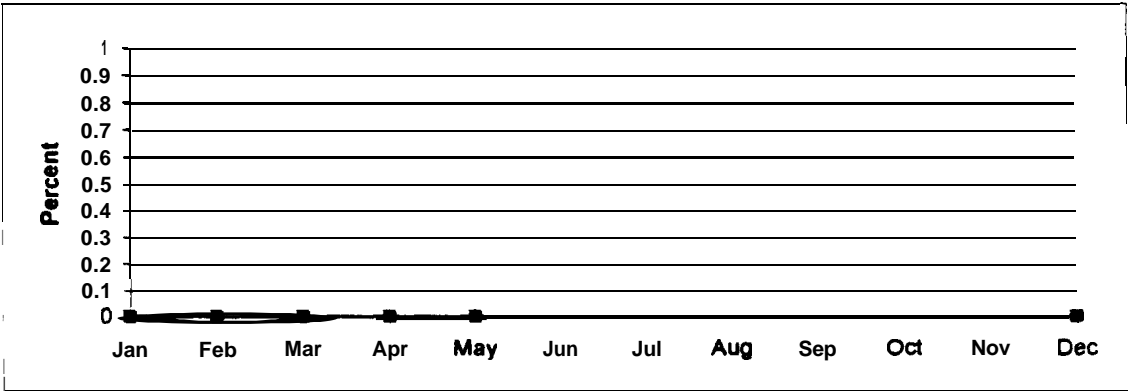
SEA LION HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)	Percent	Estimated By Community (Expanded)	Percent
Adult Male	0	—	0.0	—
Adult Female	0	—	0.0	—
Adult Unknown Sex	0	—	0.0	—
Juvenile Male	0	—	0.0	—
Juvenile Female	0	—	0.0	—
Juvenile Unknown Sex	0	—	0.0	—
Pup Male	0	—	0.0	—
Pup Female	0	—	0.0	—
Pup Unknown Sex	0	—	0.0	—
Male Unknown Age	0	—	0.0	—
Female Unknown Age	0	—	0.0	—
Unknown Sex and Age	0	—	0.0	—
Total	0	—	0.0	—

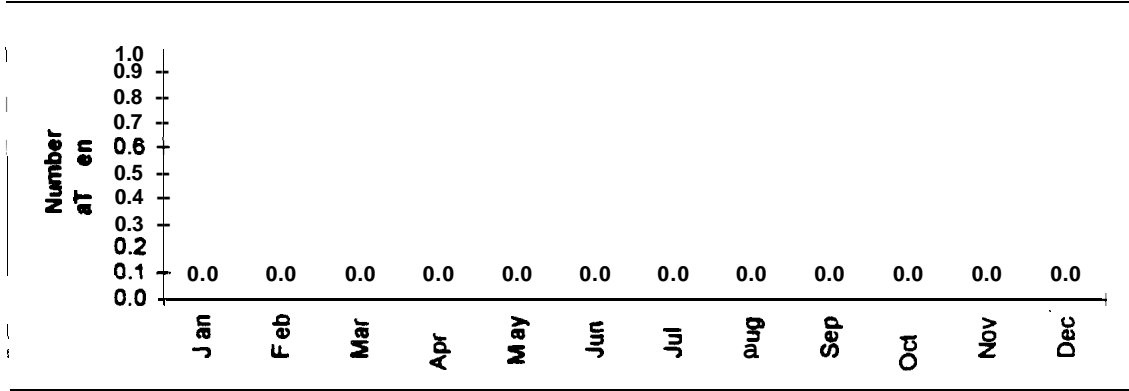
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TARE ESTIMATES: SOUTH BRISTOL BAY, 1993

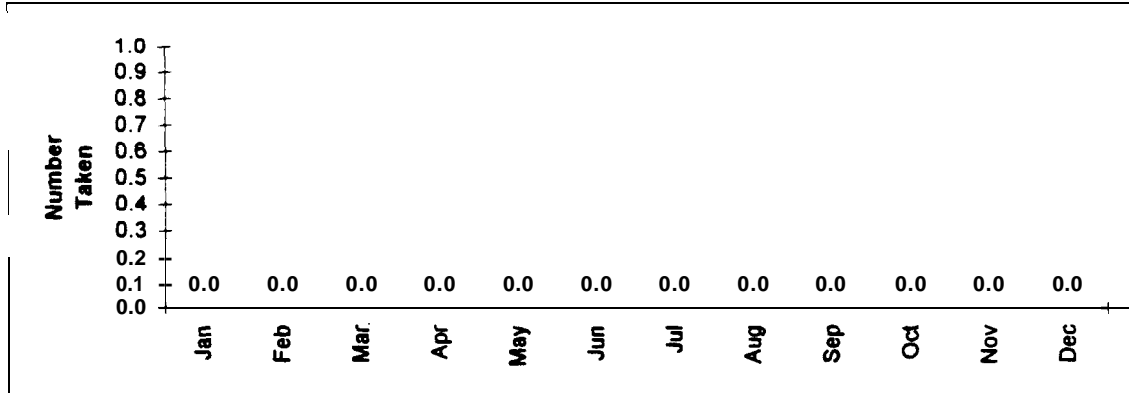
A. Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitoring System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) HARVEST AND TAKE ESTIMATES: NORTH BRISTOL BAY, 1993

SAMPLING DESIGN: MIXED

	Active	Other	Total
Total Native Households	71	630	701
Surveyed Households	67	131	198
Sampling Fraction	94.4%	20.8%	28.2%
Sample Household Members	299	526	825
Estimated Household Members	317.1	2287.5	2604.6

SEA LION HARVEST AND USE INFORMATION

Percent Of Native Households:

used	5.1%
Hunted	0.5%
Harvested	0.3%
Received	4.9%
Gave Away	0.2%

Estimated Community Harvest and Take (Expanded):

Total Number Harvested	3.3
Total Number Struck and Lost	3.3
Total Number Taken	6.5
Number Harvested Per Capita	0.00

SEA LION HARVESTBY SEASON													Unknown	
	Jan	Fob	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month	Total
REPORTED HARVEST BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	1	0	0	1	1	0	0	0	3
Struck and Lost	0	0	0	0	1	0	0	0	0	1	0	0	1	3
Tow Take	0	0	0	0	1	1	0	0	1	2	0	0	1	6
ESTIMATED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1	1.1	0.0	0.0	0.0	3.3
Struck and Lost	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1	3.3
Total Take	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	1.1	2.2	0.0	0.0	1.1	6.5
ESTIMATED SEASONALLY ADJUSTED HARVEST BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1	1.1	0.0	0.0		3.3
Struck and Lost	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	1.6	0.0	0.0		3.3
Total Take	0.0	0.0	0.0	0.0	1.6	1.1	0.0	0.0	1.1	2.7	0.0	0.0		6.5
Total Take (%)	0.0%	0.0%	0.0%	0.0%	25.0%	16.7%	0.0%	0.0%	16.7%	41.7%	0.0%	0.0%		100%
Cumulative Take	0.0	0.0	0.0	0.0	1.6	2.7	2.7	2.7	3.6	6.5	6.5	6.5		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	25.0%	41.7%	41.7%	41.7%	56.3%	100.0%	100.0%	100.0%		

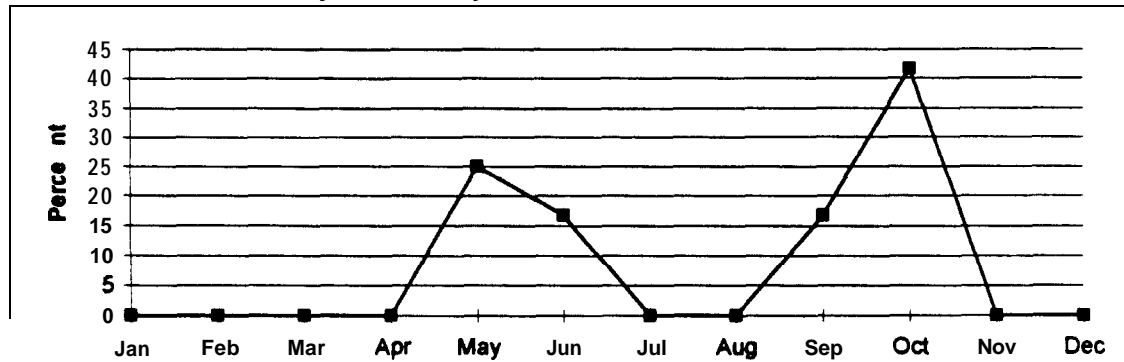
SEA LION HARVEST BY AGE AND SEX

	Reported By Sample (Unexpanded)		Estimated By Community (Expanded)	
		Percent		Percent
Adult Male	0	0.0%	0.0	0.0%
Adult Female	0	0.0%	0.0	0.0%
Adult Unknown Sex	1	33.3%	1.1	33.3%
Juvenile Male	1	33.3%	1.1	33.3%
Juvenile Female	0	0.0%	0.0	0.0%
Juvenile Unknown Sex	1	33.3%	1.1	33.3%
Pup Male	0	0.0%	0.0	0.0%
Pup Female	0	0.0%	0.0	0.0%
Pup Unknown Sex	0	0.0%	0.0	0.0%
Male Unknown Age	0	0.0%	0.0	0.0%
Female Unknown Age	0	0.0%	0.0	0.0%
Unknown Sex and Age	0	0.0%	0.0	0.0%
Total	3	100.0%	3.3	100.0%

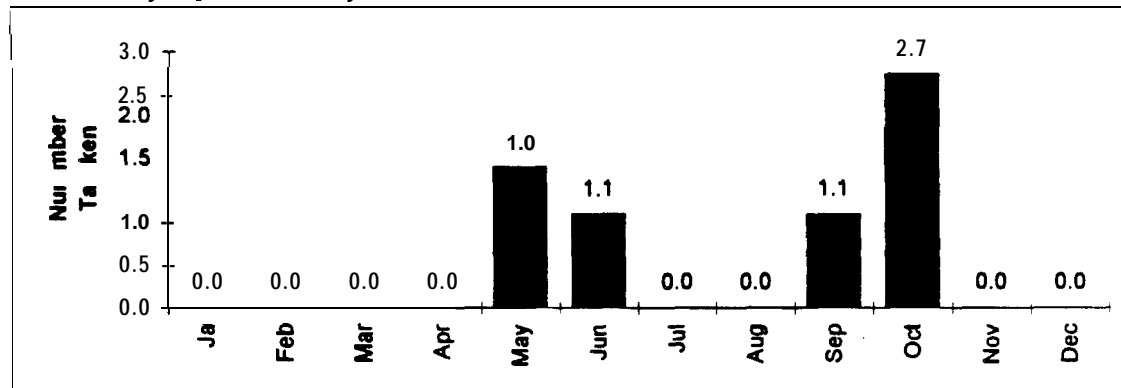
SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitor System for Sea Lions and Harbor Seals in Alaska.

SEA LION (*Eumetopias jubatus*) TAKE ESTIMATES: NORTH BRISTOL BAY, 1993

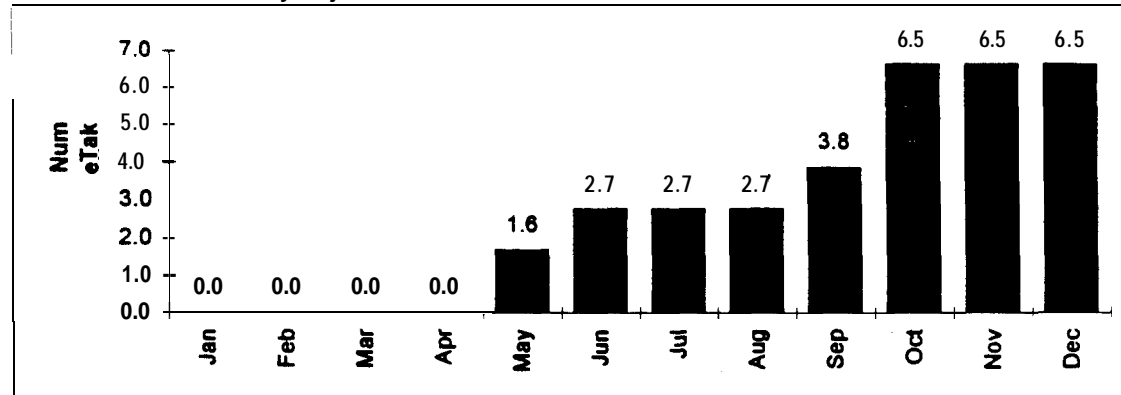
A Percentage Seasonally Adjusted Take By Month



B. Seasonally Adjusted Take By Month



C. Cumulative Seasonally Adjusted Take By Month



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Subsistence Study and Monitoring System for Sulfur and Herring in the North Bristol Bay.

